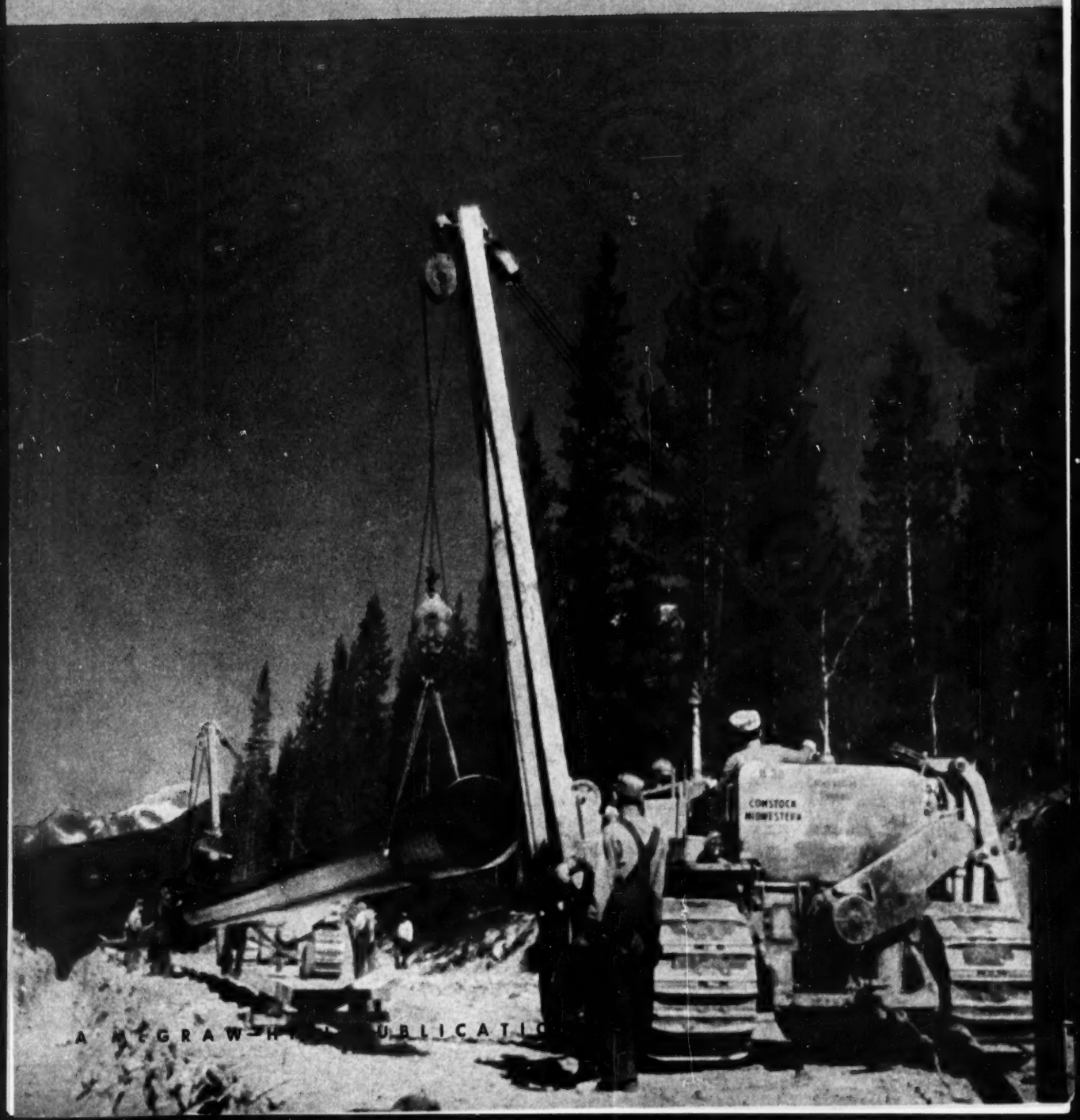
35 CENTS

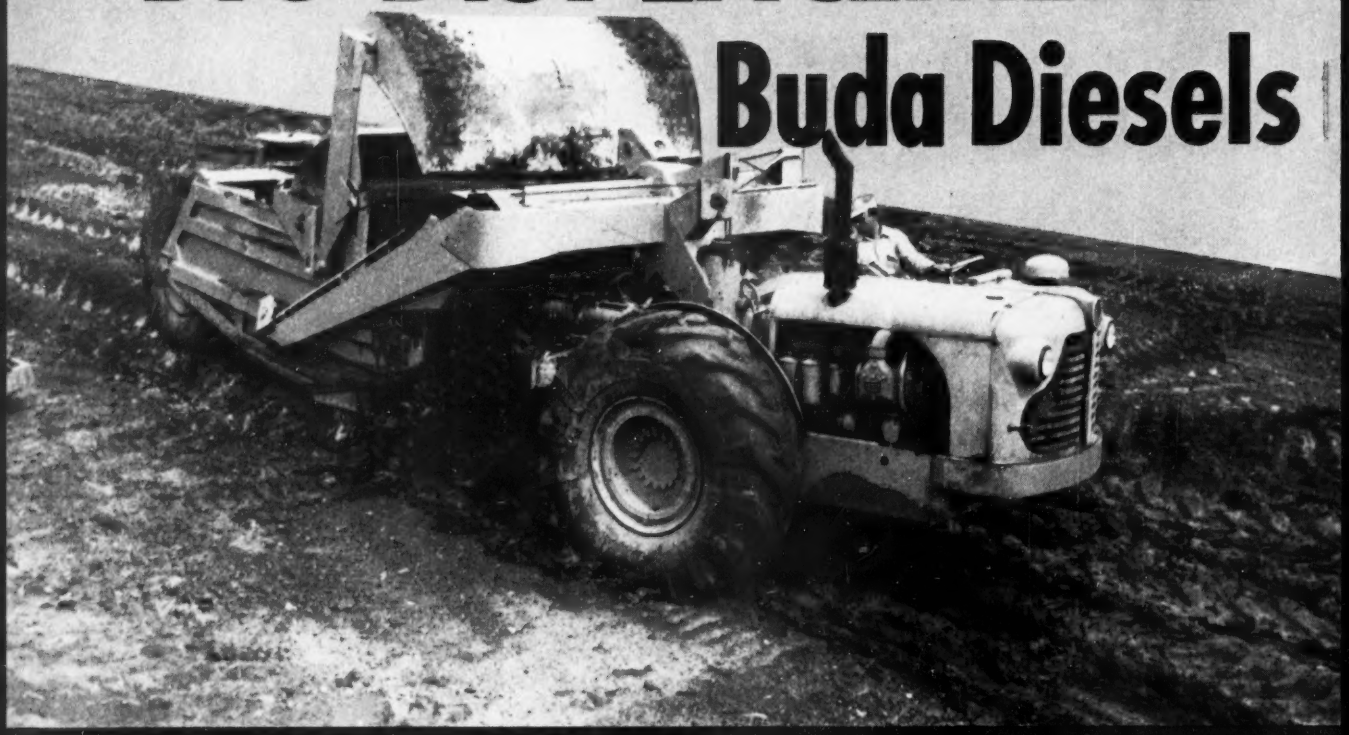
CONSTRUCTION METHODS AND EQUIPMENT

February 1953



A MCGRAW-H[illegible] PUBLICATIO[illegible]

BIG DISPLACEMENT Buda Diesels

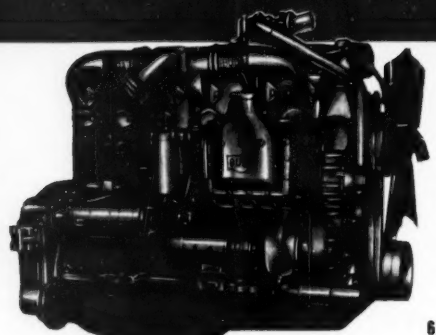


...means faster loading, traveling, spreading

MORE POWER... GREATER TORQUE PAYS OFF IN MORE PRODUCTION FROM EVERY UNIT

The *extra* piston displacement in Buda Dyna-Swirl Diesels gives your equipment more power and higher torque . . . resulting in more trips per hour and lower costs per yard of dirt moved. Buda Diesels are heavy duty workhorses—built to stand up to tough service . . . to keep delivering maximum horsepower with less maintenance and downtime.

You need all the power you can get for dozers, scrapers, tractors, shovels and trucks—and you can get *more* power from Buda Diesels.



6-DAS-844 Supercharged
280 HP at 2100 RPM

- **12 to 18% MORE HORSEPOWER at normal operating speeds**
- **10 to 17% HIGHER USEABLE TORQUE for greater lugging ability**
- **Dyna-Swirl Combustion gives more power per gallon of fuel . . . less fuel for more power**
- **6000 or more hours of operation between overhauls . . . lower maintenance costs per hour of operation**
- **Smooth, quiet operation . . . less exhaust fumes and smoke . . . less vibration . . . more operator comfort**

BUDA
COAST TO COAST
FACTORY EXPERIENCED SERVICE AND PARTS

a Power-Full and Dependable Engine
FOR EVERY NEED

BC-2

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER

B. F. Goodrich steel cord belt rushes iron ore through a mountain

Belt for longer, higher, single-flight conveyors

UP THAT steep grade, through a mountainside, to a height of 17 stories, go *1,000 tons* of iron ore *every hour*—24 hours a day. It's a B. F. Goodrich steel cord conveyor belt this heavy ore is rough-riding—a belt especially designed for the efficient handling of material under the severest conditions. Here's why B. F. Goodrich steel cord belt construction can make conveyor systems of lengths and lifts far exceeding anything formerly possible:

Strength for long hauls—In this exclusive B. F. Goodrich belt design, individual steel cords run lengthwise, each completely surrounded by rubber. These parallel cords give tremendous strength, yet are flexible so that troughing is natural, belt keeps centered on idlers, spillage is held to a minimum.

Strength for long life—Plies of nylon-filled cotton fabric, placed across belt width, act as a shock absorber, permit belt to "give" crosswise when impact occurs, prevent longitudinal tearing.

Single-flight economy—Steel cord construction now makes possible a single-flight conveyor for installations where a combination of high lifts and long distances exists. It eliminates the transfer points necessary with a conveyor system built in several stages with ordinary belts.

If you need a conveyor belt that must take severe impact on loading, and haul heavy loads up steep inclines, let your local BFG distributor show you how a B. F. Goodrich steel cord belt can do the job more efficiently and at lower cost than a system built in several flights. For the name of your nearby distributor, or for more information, just write *The B. F. Goodrich Company, Industrial & General Products Division, Akron, Ohio.* (Available in Canada)

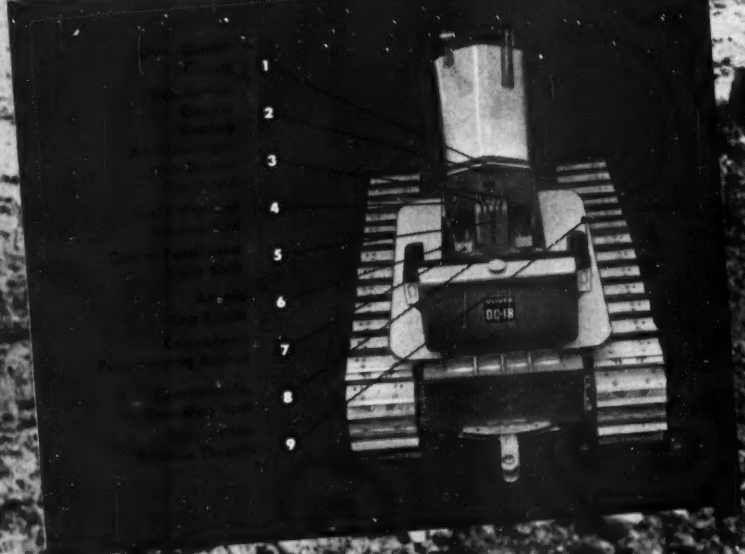
Conveyor Belts BY
B.F.Goodrich
RUBBER FOR INDUSTRY

Owners' pride...
Operators' delight...

Owners can't say enough good things about the new Oliver "OC-18". They keep telling us how it does more work... how that full 133* drawbar horsepower gives it plenty of power for the really tough jobs . . . about its low operating and maintenance costs . . . and how the operators and mechanics like it.

Operators are even more enthusiastic. It's the first big tractor they've found that is designed to make life easier for them. They tell us that toward the end of a long day on the "OC-18", they are much less fatigued, much more fit to continue giving top performance. The illustration shows clearly the 9 important "easy operating" features of the "OC-18". No other tractor boasts all these. They make the "OC-18" "the operators' dream come true."

*OFFICIAL NEBRASKA TEST NO 489



THE OLIVER CORPORATION

400 W. Madison St., Chicago 6, Illinois

A complete line of industrial wheel and crawler tractors

the NEW OLIVER "OC-18"

Ask your Oliver Industrial Distributor to arrange a demonstration. Or if you prefer, write to the Oliver Corporation, 400 W. Madison St., Chicago 6, Ill.

Your choice of COLOR

IN HARD BOILED* Safety Hats

STRONGER-THAN-STEEL FIBERGLAS

crowns offer unlimited choice of vivid, permanent colors... with color molded all the way thru the safest crowns ever built. Shock-resisting ribbed design also available in aircraft grade aluminum.

Write for full Color Catalog

SAVE MONEY... save time! One size fits all heads . . . reduces inventories. Fully adjustable headband and hammock; can be changed in *six seconds*. Self-shaping and air-cushioned for comfort.

EVERYTHING BULLARD IN SAFETY — HARD BOILED *T. M. Reg.

Distributors in principal cities

E. D. BULLARD COMPANY

275 EIGHTH STREET, SAN FRANCISCO, CALIFORNIA

CONSTRUCTION METHODS AND EQUIPMENT

Volume 35, Number 2 **FEBRUARY 1953** Established 1919

Pay Dirt in This Issue

Simple Forms Make the Job Go 56
Well-planned formwork makes for easy fabrication, erection, stripping and multiple re-use on a fast-moving project.

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Equipment has to be big and good to build a finger pier 82 ft above stream bed on 24- and 18-in. pipe piles.

1,900-Ton Tower Moves on Steel Balls 78
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February 1953 **CONSTRUCTION METHODS AND EQUIPMENT** Vol. 35—No. 2
Member ABC and ABP

Published monthly by McGraw-Hill Publishing Co., Inc., James H. McGraw (1860-1948) Founder. Publication office, 330 W. 42nd St., New York 36, N. Y.

Executive, Editorial and Advertising offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Curtis W. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President, Publications Division; Ralph B. Smith, Vice-President and Editorial Director; Nelson Bond, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Director of Circulation.

Subscriptions: Address correspondence to Construction Methods and Equipment—Subscription Service, 330 W. 42nd St., New York 36, N. Y. Allow ten days for change of address. Subscriptions are solicited only from persons engaged in construction or in supplying the construction industry. Position and company connection must be indicated on subscription orders.

Single copies, 35c. Subscription rates—United States and possessions $2.00 a year; $3.00 for two years; $4.00 for three years. Canada $4.00 a year; $6.00 for two years; $8.00 for three years. Other Western Hemisphere $10.00 a year; $16.00 for two years; $20.00 for three years. All other countries $15.00 a year; $25.00 for two years; $30.00 for three years. Re-entered as second-class matter July 14, 1949, at the Post Office at New York, N. Y., under the Act of March 3, 1879. Printed in U.S.A. Copyright 1953 by McGraw-Hill Publishing Co., Inc. —All Rights Reserved.

Your BEST ASSURANCE

OF UNIFORMLY HIGH QUALITY MORTAR

5,293 barrels of LONE STAR MASONRY CEMENT were used on $9.5-million, 10-story, 500-bed Veterans Administration Hospital, New Orleans, in laying up all brick, block and stone—typical of widespread use of this high-quality mortar in structures, large and small.

VETERANS ADMINISTRATION HOSPITAL
New Orleans

Supervision:
U. S. CORPS OF ENGINEERS, NEW ORLEANS DISTRICT

General Contractor:
ROBERT E. McKEE, Dallas, Texas

Architects & Engineers:
FAVROT, REED, MATHIS & BERGMAN, New Orleans
FAULKNER, KINGSBURY & STENHOUSE,
Washington, D. C.

On Large Structures or Small, Lone Star Masonry Cement Assures Quality plus Economy

● Produced to exacting Lone Star Standards, under rigid laboratory control throughout the manufacturing process, LONE STAR MASONRY CEMENT greatly simplifies the problem of obtaining uniformly high quality mortar:

One ready-to-use cementing material instead of two means greater uniformity from batch to batch;

One less cementing material to handle . . . no lime or Portland cement to add . . . no soaking or slaking;

Extra workability and plasticity due to exceptional water retention . . . brick and block bed easier, minimum droppage, smoother work schedules;

Soundness, low absorption, high water repellency . . . durable, weather-resistant performance.

Write for this New Book

Write for this new illustrated Masonry Booklet, full of timely, useful information. Address Lone Star Cement Corporation, 100 Park Ave., New York 17—or nearest office, listed below.

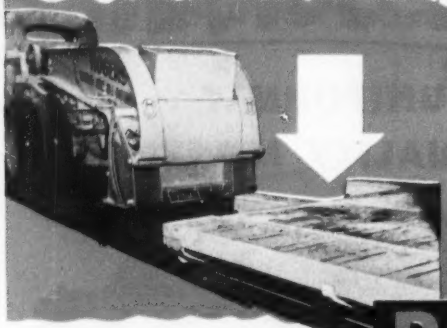
LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD

LONE STAR CEMENT CORPORATION

Offices: ABILENE, TEX. • ALBANY, N. Y. • BETHLEHEM, PA. • BIRMINGHAM
BOSTON • CHICAGO • DALLAS • HOUSTON • INDIANAPOLIS
KANSAS CITY, MO. • NEW ORLEANS • NEW YORK • NORFOLK
PHILADELPHIA • RICHMOND • ST. LOUIS • WASHINGTON, D. C.

LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 17 MODERN MILLS, 125,600,000 SACKS ANNUAL CAPACITY

"Get Down to Business"



TO A LOW LOADING DECK HEIGHT OF ONLY 16" WITH THE VERSATILE TYPE "TPG"...

ROGERS POWER LIFT DETACHABLE GOOSENECK TRAILER

PATENTS PENDING

LOW LOADING permits an easier, faster, more profitable operation in hauling equipment to and from the job.

Shovel "walks" up low deck over a minimum of blocking and rampage. *There is no stress or strain applied to the frame or gooseneck.* No blocking required under frame.

For your best buy in a multi-purpose, heavy duty trailer, investigate this versatile unit. It incorporates every desirable "job-proved" feature originated by Rogers.

CAPACITIES: 15, 20, 25, 30, 35, 40, 50, 60 & 75 TONS

DETACHES, LOADS AND ATTACHES IN 5 MINUTES —
LOADS EASILY OVER LOW FRONT OF DECK —
RAISES ITS DECK TO CLEAR HIGH BANKED CROSSINGS —
STOOPS TO CLEAR LOW OVERHEAD OBSTRUCTIONS —
20" & 24" TIRES INSURE GREATER TIRE LIFE, LARGER AND MORE EFFECTIVE BRAKES: AND OFTEN PERMIT INTERCHANGEABILITY WITH TRACTOR TIRES.

THE ROGERS Power Lift DETACHABLE GOOSENECK CAN BE OBTAINED ON ANY STANDARD ROGERS DROP DECK TRAILER

Write for the LATEST CATALOG

EXPERIENCE builds 'em PERFORMANCE sells 'em

ROGERS BROS. CORP.

ALBION, PENNA. CABLE: BROSITES

220 Orchard Street

Export Office: 50 Church St. New York 7, N. Y., U.S.A. Cable Address: Brosites

Also of timely interest is this ROGERS Tag-A-Long trailer which makes a dump truck serve as a tractor and effects sizeable savings for contractors.

★ JOB TALK ★

Safety With Explosives

EXPLOSIVES employed by industry are among the most useful prime movers. But their daily bread-and-butter value sometimes is overshadowed by the more spectacular news of an accident occurring when energy is misdirected.

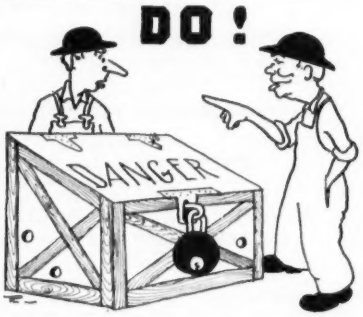
The Institute of Makers of Explosives maintains that safe use of explosives is the result of planning and doing the job right. To back up this point, the Institute has prepared a list of 66 "Don'ts" to help those who handle or work around explosives. These rules are not meant to supersede laws on the handling of explosives in those areas where they may conflict.

Terms contained here are as follows:

"Explosives" shall signify any or all of the following: dynamite, black blasting powder, pellet powder, blasting caps, and electric blasting caps.

"Electric blasting cap" shall signify any or all of the following; instantaneous electric blasting caps, delay electric blasting caps, and delay electric igniters with blasting caps attached.

1. DON'T purchase, possess, store, transport, handle, or use explosives except in strict accordance with organizational, local, state, and federal regulations.

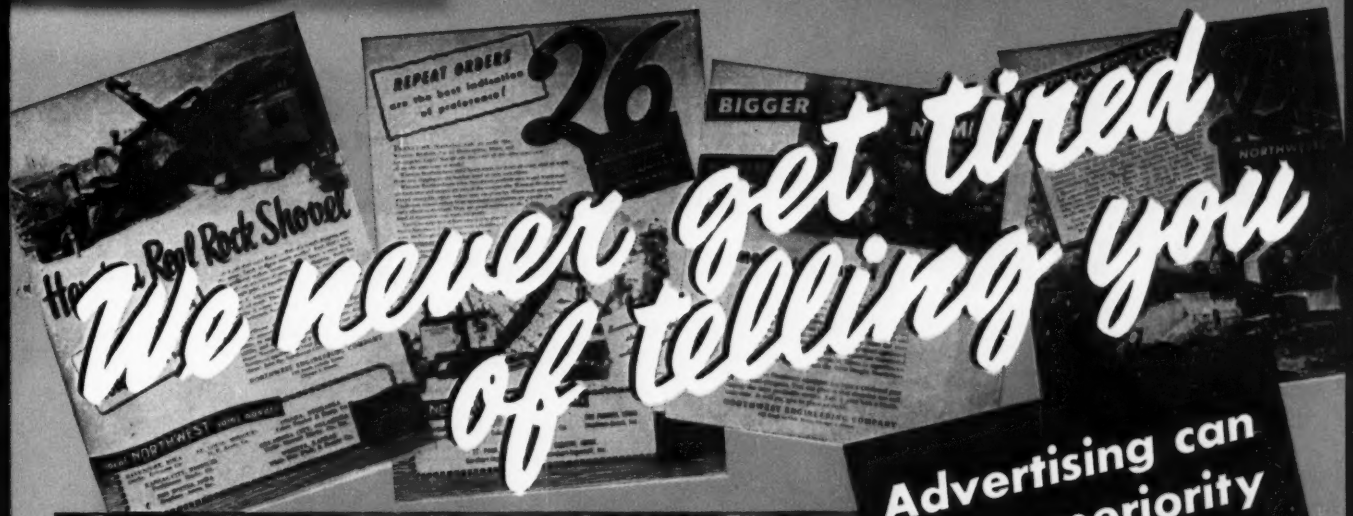


2. DON'T store explosives anywhere except in a magazine which is clean, dry, well ventilated, properly located, substantially constructed, and securely locked.

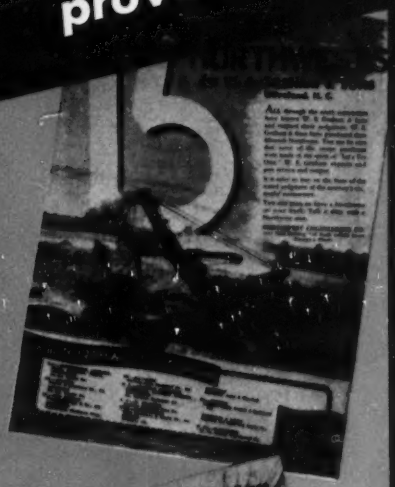
3. DON'T allow persons under eighteen years of age to handle or use explosives, or to be present where explosives are being handled or used.

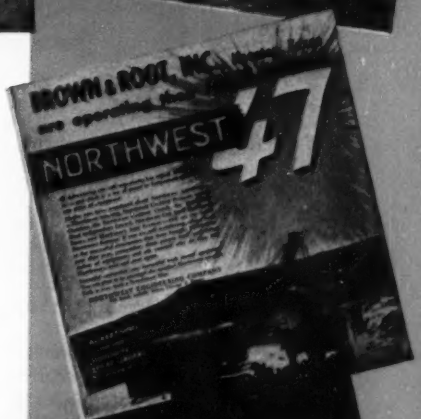
(Continued on page 12)

We never get tired of telling you



Advertising can talk superiority but . . . REPEAT ORDERS prove it!





A lot of people have said to us, "Don't you get tired of running those ads with numbers in them, telling about repeat orders, year after year"? Remember this; Advertising can talk superiority but a repeat order proves it. There is no better endorsement of the performance of a piece of equipment. Remember, too, there are a lot of manufacturers that can't do this *month after month and year after year!*

A repeat order tells you better than all the type we could use that what we claim is *so.* It proves that Northwest equipment is *profitable* equipment to own and the fact that we have been able to run this type of advertising for years proves that Northwest has *maintained quality and more than kept abreast of conditions.* That, too, is why one out of every three Northwests sold is a repeat order.

Successful Contractors Stay Successful With Proved Equipment

NORTHWEST ENGINEERING COMPANY
1503 Field Bldg., 135 South LaSalle St., Chicago 3, Ill.

NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

B.F.Goodrich tires
roll 50,000 miles on rocks and gravel

Clayton Baum points out Rock tire tread details to Owner M. C. Hubbell.

HAULING ore from mine to mill is the job of the tractors and trailers of the M. C. Hubbell Company, Sahuarita, Arizona. These units carry 18 to 21-ton loads over winding, hilly roads that cause constant weight shifting — over roads strewn with abrasive gravel and razor-sharp rock that cut and chew tires.

Uneven wear and premature failure are common and costly occurrences when most tires operate under such severe conditions. But not in the case of the tires used by Hubbell. They are B. F. Goodrich tires, chosen after exhaustive tests of all types of tires. BFG Rock tires have chalked up better than 50,000 miles and are giving 30% more service than any tires ever used. No wonder this company's equipment rolls on B. F. Goodrich tires exclusively.

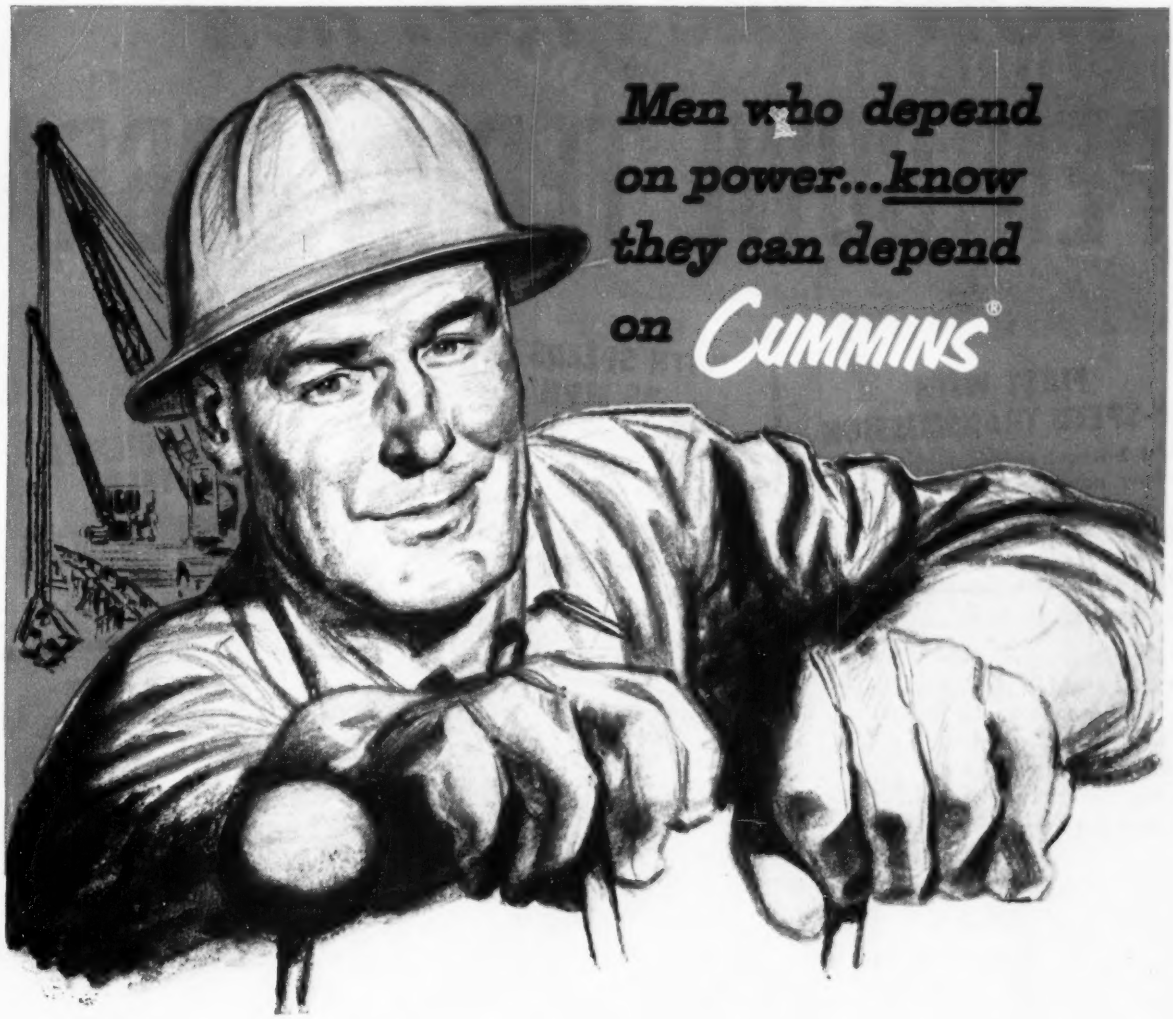
Owner M. C. Hubbell likes the tough, cut-resistant tread and husky, full-traction cleats of the Rock tire. And like all other BFG off-the-road tires, the Rock tire is built with the patented nylon shock shield. Layers of strong, elastic nylon cords are built into the tire between the tread and cord body. Under impact, these cords stretch together to shield the tire body from shocks and bruises. You profit four ways from this exclusive nylon shock shield:

(1) more recappable tires and more hours of service per recap (2) more original hours of service (3) greater bruise resistance (4) less danger of tread separation. The nylon shock shield is found in all tires of 8 or more plies — *double* shield in larger sizes.

It costs you no more to get the extra advantages and additional hours of service B. F. Goodrich tires give. See the B. F. Goodrich retailer for what's new in off-the-road tires. His address is listed under Tires in the Yellow Pages of your phone book. *The B. F. Goodrich Company, Akron, Ohio.*

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

Always specify B. F. Goodrich tires when you order new equipment.



CUMMINS DIESELS *are engineered to make light work of tough jobs*

Progressive, eyes-ahead engineering is one of the big reasons why so many construction men pick Cummins Diesels for dependability.

Consider Cummins' exclusive system of fuel injection and metering—an important factor in the unequalled performance records established by lightweight, high-speed (60-600 h. p.) Cummins Diesels. No other Diesel fuel system is so simple . . . so rugged! It delivers a uniform, properly prepared fuel charge to every cylinder. All under low pressure—no chance of bursting and leaking fuel lines.

Your Cummins dealer will be glad to tell you more about the exclusive fuel system and other engineering advantages built into every Cummins Diesel. He is an expert who knows the requirements of your job. He heads up a specialized parts and service organization—equipped to handle all your diesel power needs. Call him today . . . or write!

CUMMINS ENGINE COMPANY, INC.
Columbus, Indiana
Export: Cummins Diesel Export Corporation
Columbus, Indiana, U.S.A. • Cable: CUMDIEX

CUMMINS

TRADEMARK REG. U.S. PAT. OFF. PENDING

***Leaders* in rugged, lightweight, high-speed diesel power!**

Cummins Engine Company, Inc.
Columbus, Indiana CME-2
Please send me the informative, illustrated booklet: "Dependable Diesel."

Name _____

Company _____ *Position* _____

Address _____

City _____ *Zone* ____ *State* _____

NOW! the great new

OPEN BOWL TERRA COBRA

FIRST WITH 10-SPEED TRANSMISSION

First 2-wheel tractor units to offer proper power to speed ratios for highest production under all job conditions!

WITH SPEEDS TO 35 MPH

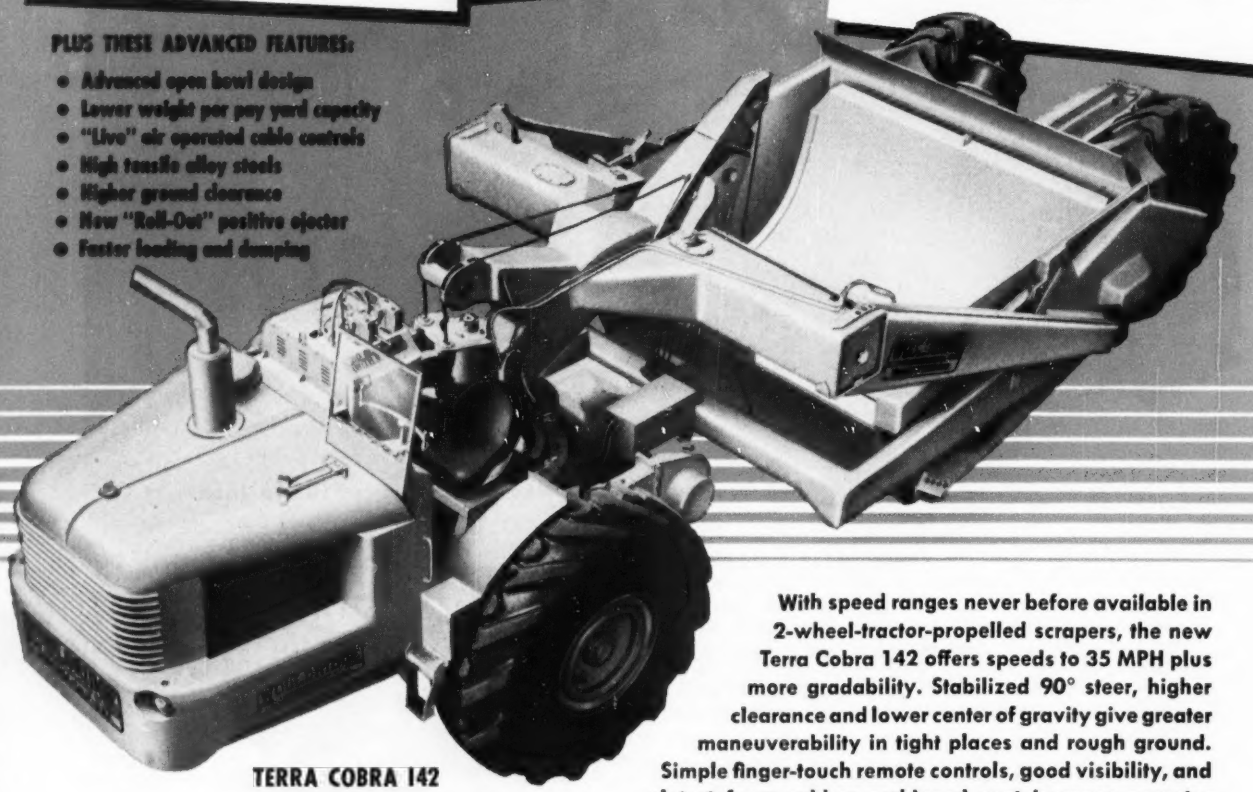
Conservatively rated, with range of 10 speeds forward and two in reverse!

WITH STABILIZED 90° STEER

Balanced for maximum stability in every steering position under all load conditions!

PLUS THESE ADVANCED FEATURES:

- Advanced open bowl design
- Lower weight per pay yard capacity
- "Live" air operated cable controls
- High tensile alloy steels
- Higher ground clearance
- New "Roll-Out" positive ejector
- Faster loading and dumping



TERRA COBRA 142

18 yard capacity 225 HP engine

With speed ranges never before available in 2-wheel-tractor-propelled scrapers, the new Terra Cobra 142 offers speeds to 35 MPH plus more gradability. Stabilized 90° steer, higher clearance and lower center of gravity give greater maneuverability in tight places and rough ground. Simple finger-touch remote controls, good visibility, and latest foam rubber cushioned seat increase operator efficiency and comfort. Big low pressure tires combine high flotation and carrying capacity. Extra ruggedness keeps 'em rolling. Simplicity reduces servicing. Let your Wooldridge Distributor show you today why the new more versatile Terra Cobra 142 can handle more jobs per year—earn more profits per job.

WOOLDRIDGE

WOOLDRIDGE MANUFACTURING COMPANY

SUNNYVALE, CALIFORNIA

FASTER • MORE VERSATILE • MORE MANEUVERABLE • MORE RUGGED • MORE PRODUCTIVE

Terra Cobra

Terra Cobra Wagon

Power Control Units

Scrapers

Rippers

Bulldozers

LOOK JOE!... FREE TRIAL GUARANTEES Your... Clipper MASONRY SAW WILL PAY FOR ITSELF!

LOOK for the BRIGHT ORANGE COLOR and the TRADEMARK CLIPPER

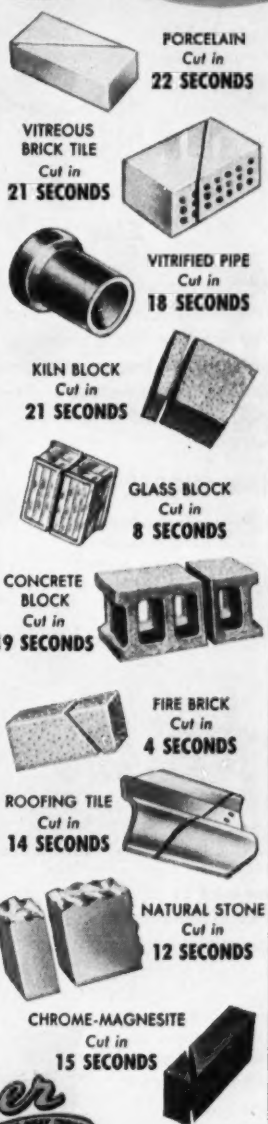
MR. CLIPPER

MODEL HD

15 MODELS PRICED FROM $265

CUT *Any* MASONRY MATERIAL *Easier - Faster* WITH A NEW CLIPPER MASONRY SAW

HERE'S WHY! . . . The DUSTLESS Clipper operates right beside your bricklayers because the Clipper is PORTABLE . . . easily moved from basement to roof. One Clipper Model HD with a Clipper Diamond Blade will do the cutting of 3 ordinary abrasive saws! This is possible *ONLY* with such Patented Clipper features as . . . the Pressure Equalizer Spring, the Famous Select-A-Notch, Water Application System, and Adjust-A-Cut which makes possible One-Spot Operation.



PORCELAIN *Cut in* 22 SECONDS

VITREOUS BRICK TILE *Cut in* 21 SECONDS

VITRIFIED PIPE *Cut in* 18 SECONDS

KILN BLOCK *Cut in* 21 SECONDS

GLASS BLOCK *Cut in* 8 SECONDS

CONCRETE BLOCK *Cut in* 19 SECONDS

FIRE BRICK *Cut in* 4 SECONDS

ROOFING TILE *Cut in* 14 SECONDS

NATURAL STONE *Cut in* 12 SECONDS

CHROME-MAGNESITE *Cut in* 15 SECONDS

OUR ONLY BUSINESS FOR NEARLY 20 YEARS . . . MASONRY AND CONCRETE SAWING!

The unqualified Clipper guarantee of satisfaction is backed by world-wide experience, the ability to select the finest materials, and the "know-how" to put them together.

. . . and Still Delivered to You on FREE TRIAL

ORDER TODAY . . . on FREE TRIAL. Discover for yourself how CLIPPER . . . will increase your profits by increasing your production at reduced costs. CLIPPER'S "On the Job" FREE TRIAL guarantees you satisfaction at no obligation!

INCREASE YOUR PROFITS . . . Saw Concrete Before Breaking for Patches and Trenches

Save up to 50% in labor and material. Saw repair patches—gas, water, sewer and air line trenches in floors, streets, walks, runways and highways. Save, too, by sawing contraction joints—eliminate costly hand forming and spalling.

5 MODELS, GAS OR ELECTRIC POWERED

MODEL C-130

CLIPPER "CONSAWS"

"CBR" DIAMOND ABRASIVE

DON'T GAMBLE Depend on *Genuine* CLIPPER SUPERIOR BLADES

. . . guaranteed to "Consistently Provide the fastest cut . . . at the lowest cost . . . with the greatest ease!" Clipper alone can supply **all** specifications of Abrasive, Diamond and "CBR" (Break-Resistant) Blades to accurately meet your requirements. INVEST IN CLIPPER and YOU'LL GET RESULTS!

MR. CLIPPER

SAME DAY SERVICE FROM YOUR NEAREST FACTORY BRANCH—

KANSAS CITY 8, MISSOURI

COAST TO COAST

- PHILADELPHIA
- ST. LOUIS
- CLEVELAND
- DETROIT
- AUSTIN, TEX.
- CHICAGO
- LOS ANGELES
- BOSTON
- HOUSTON
- MILWAUKEE
- ST. PAUL
- INDIANAPOLIS
- NEW YORK
- PITTSBURGH
- DENVER
- SAN FRANCISCO
- CINCINNATI
- ATLANTA
- WASHINGTON, D.C.
- BIRMINGHAM
- CHARLOTTE, N.C.
- DALLAS
- KANSAS CITY

IN CANADA — P.O. BOX 476, WINDSOR, ONTARIO

MAIL COUPON NOW

SOLD ONLY DIRECT FROM FACTORY BRANCHES

CLIPPER MANUFACTURING CO.
2809 E. WARWICK • KANSAS CITY 8, MO.

Send FREE Literature and Prices on:

- ☐ CLIPPER MASONRY SAWS
  - ☐ DUSTLESS MODELS
  - ☐ DRY ONLY MODELS
- ☐ CLIPPER CONSAWS
- ☐ CLIPPER ABRASIVE BLADES
  - ☐ WET ☐ DRY
- ☐ CLIPPER DIAMOND BLADES (95)

COMPANY_____

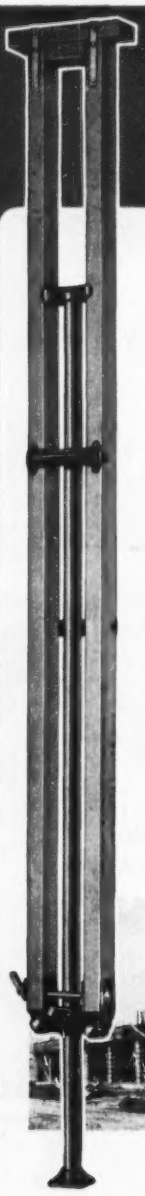
ADDRESS_____

CITY_____ STATE_____

CONTRACTORS KNOW . . .

they get FASTER SHORING

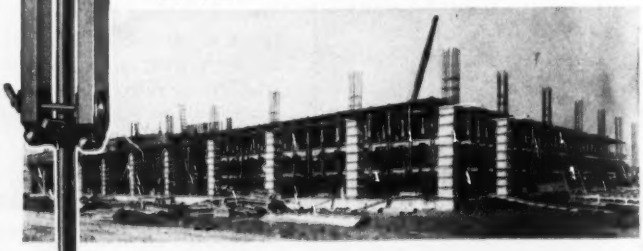
WITH **ROOSHORS**



Rooshors help speed your progress schedules. They are easily set . . . instantly and accurately adjusted to any fraction of an inch by one man. There are no loose pins and no screw adjustments to become clogged. They have longer adjustments in their ranges of three sizes: 8 ft. to 14 ft.; 7 ft. to 13 ft.; and 5 ft. to 9 ft. . . . higher stories are shored with

ROOS EXTENTION SHORES

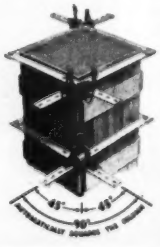
Roos Extension Shores are standard adjustable Rooshors with a flat steel head into which any length S4S 4 x 4 can be instantly inserted in the top of the Shore to take care of heights over 14 ft.



Rooshors have been used by contractors from coast to coast for over 35 years. More Rooshors are in use than any other adjustable shore!

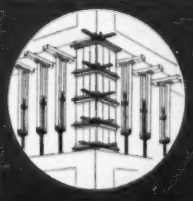
ROOS COLUMN CLAMPS

Roos Column Clamps, consisting of two identical hinged units, eliminate waste time and motion in fitting and adjusting. They are foolproof, there is no wrong way to put them on . . . no loose parts to cause needless delays and a hammer is the only tool needed.



WRITE TODAY FOR BULLETIN 253

Rooshors and Roos Column Clamps are available for rental with purchase option from warehouse stocks in principal cities.



BAKER-ROOS, INC.

602 W. McCARTY STREET

INDIANAPOLIS 6, INDIANA

JOB TALK . . . Continued from p. 6

4. DON'T leave explosives lying around where children can get them.

5. DON'T allow leaves, grass, brush, or debris to accumulate within 25 ft of an explosive magazine.

6. DON'T smoke or have matches, open lights, or other fire or flame, in or near an explosive magazine, or have them near by while handling or loading explosives.

7. DON'T shoot into explosives with any firearm, or allow shooting in the vicinity of an explosives magazine.

8. DON'T store any metallic tools or implements in an explosives magazine.

9. DON'T drop, throw, or slide packages of explosives or handle them roughly in any manner.

10. DON'T open kegs or cases of explosives in a magazine.

11. DON'T open kegs or wooden cases of explosives with metallic tools. Use a wooden wedge and wooden, rubber, or fiber mallet. Metallic slitters may be used for opening fiberboard cases, provided that the metallic slitter does not come in contact with the metallic fasteners of the case.

12. DON'T store or leave packages of explosives which have been opened without replacing the cover.

13. DON'T use empty explosives cases for kindling.

14. DON'T permit any paper product used in the packing of explosives to leave your possession. Accumulations of fiberboard cases, paper case liners, cartons, or cartridge paper should be destroyed by burning after they have been carefully examined to make sure that they are empty.

15. DON'T use explosives that are obviously deteriorated.

16. DON'T attempt to reclaim or

(Continued on page 30)

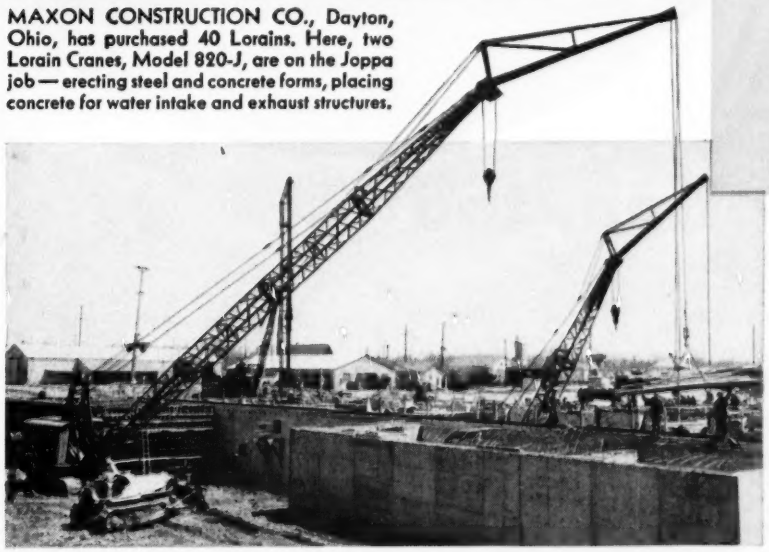
JOPPA JOB REPORT

JOPPA, ILLINOIS, PROJECT OF ELECTRIC ENERGY, INC. TO SUPPLY POWER FOR ATOMIC ENERGY COMMISSION PLANT, PADUCAH

18 LORAINS

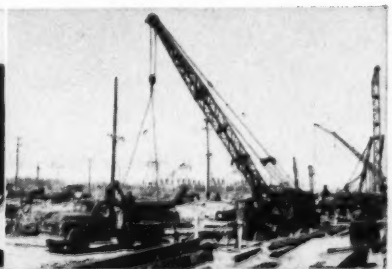
HELP BUILD NEW 1,300,000 K. W. $56,000,000 POWER PLANT

MAXON CONSTRUCTION CO., Dayton, Ohio, has purchased 40 Lorains. Here, two Lorain Cranes, Model 820-J, are on the Joppa job — erecting steel and concrete forms, placing concrete for water intake and exhaust structures.



EBASCO SERVICES, Inc., New York City, prime contractors on the huge Joppa project, use two Lorain Cranes, Model 820-J, to erect one of the many structures. Ebasco has purchased 11 Lorains.

EDGAR STEPHENS & SONS, Inc., Cairo, Illinois — a 5-time Lorain owner — supplies concrete for the project. These two 1-yd. Lorain Clamshells, Model 50-K, on 14 ft. long crawlers, unload, stockpile materials and charge a 30-yd. bin.



SAMUEL KRAUS CO., St. Louis, Missouri, has 3 of their 4 Lorains on their 1,000,000 cu. yd. earthmoving contract. A 20-ton Lorain Moto-Crane is shown unloading cars.

Big jobs — big names — and Lorain shovel-cranes go together. Here, in the making, is one of the world's greatest centers of electric power. Located on the north bank of the Ohio River, the big Joppa project will put forth 1,300,000 kilowatts that will feed the vital $700,000,000 Atomic Energy Commission plant across the river at Paducah. Two mammoth generating stations are being built — and Lorains are scattered all over the job.

It's a big job — all the way. Big name contractors are at work. Four of them moved in 18 Lorains to handle a wide variety of jobs. These four Lorain owners, named in the photo captions, have purchased a total of 60 Lorains.

Big jobs — big names — and Lorains go together — for reasons you would expect. Dependability through quality design. Selection to answer every job need. Experience that has proved Lorain performance. Big job — or small — these same reasons will pay you to check with your Thew-Lorain Distributor for your very next shovel-crane need!

THE THEW SHOVEL CO.
LORAIN, OHIO

THEW LORAIN

Put more "PUSH" IN YOUR ENGINES

. . . and cut fuel consumption, too

TEXACO URSA OIL X** works for you two ways. It 1) lubricates and 2) keeps engines clean. This puts more "push" in your engines by letting full power come through. Same time, it cuts down the fuel you use and slices a healthy amount from your maintenance costs.

*Texaco Ursa Oil X*** is fully detergent, fully dispersive. Harmful carbon, gum and sludge don't get a chance to form. Rings stay free. Bearings get ace-high protection against wear and corrosion. *Texaco Ursa Oil X*** will stand up in the toughest service.

In chassis bearings, use *Texaco Marfak*. Because it stays in the bearings, your equipment stays out of the shop. And that goes for *Texaco Marfak Heavy Duty*, too – the long-lasting protection for wheel bearings that needs no seasonal change. *More than 500 million pounds of Texaco Marfak have been sold!*

To get the most out of your equipment, call in a Texaco Lubrication Engineer. Just contact the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

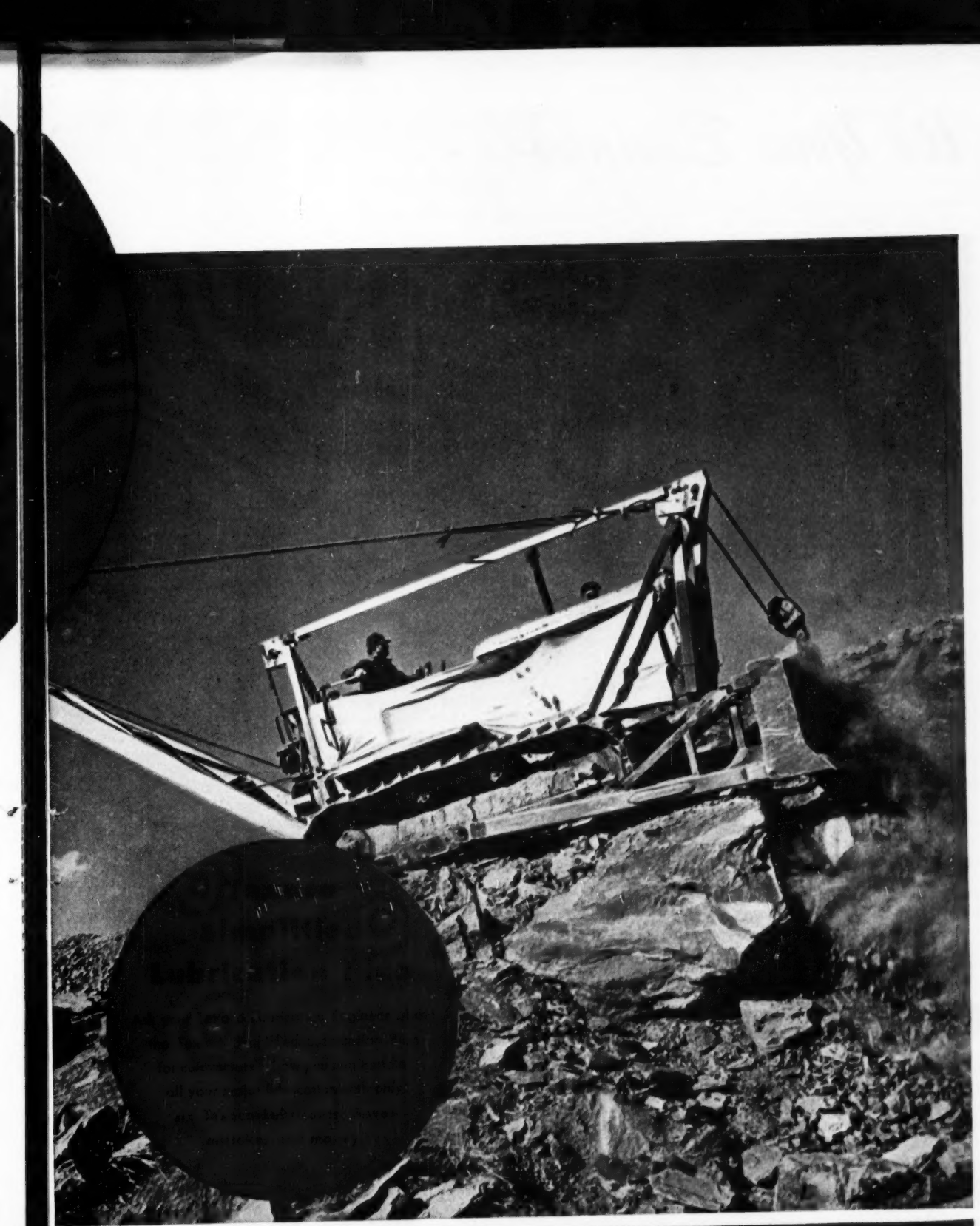
☆ ☆ ☆

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE, on television Tuesday nights. METROPOLITAN OPERA radio broadcasts Saturday afternoons.

TEXACO

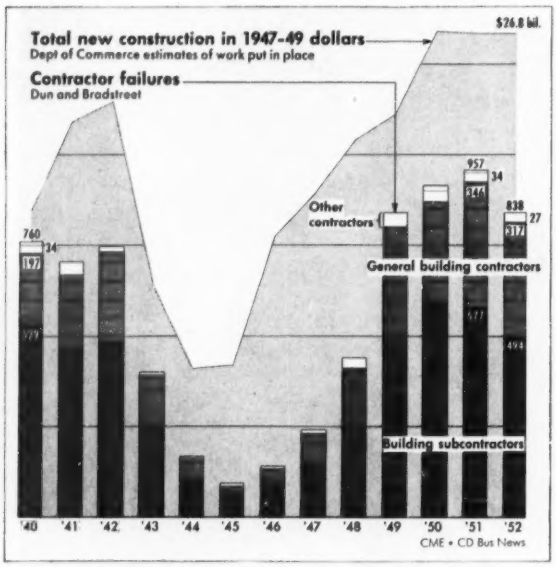
TEXACO



Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

It's Your Business . . .



CONTRACTOR FAILURES follow construction volume curve in general, but last year dropped in face of increased work. Building subcontractors are always hit hardest, with general builders following close.

Contractor Failures Off Slightly Last Year

FOR THE FIRST TIME since 1945 the year 1952 saw a decline in number of construction firm failures from the previous year, according to last minute reports by Dun & Bradstreet. A total of 838 contractors went bankrupt in 1952 with liabilities of $36,145,000. As usual, building subcontractors led the list with 494 failures, but their liabilities were $14,037,000, as compared with 317 general builders with liabilities of $20,812,000. Highway and heavy contractor failures were relatively skimpy, 27, with only $1,296,000 in losses.

In the 13 yr since 1939, Dun & Bradstreet has reported 7,226 contractor failures, with liabilities totaling just under 200 million dollars. Heaviest liabilities in this period were racked up by general builders, $105,561,000 for 2,423 failures. Greater in number, but not so expensive, were building subcontractors with 4,512 failures totaling $75,986,000. Heavy and highway general contractors fared much better, with only 291 bankruptcies and liabilities of $18,091,000 during the 13-yr period.

While 1952 seemed to be a slight exception, contractor failures usually follow the construction volume curve, as shown by the accompanying chart.

ARE THE DIRTMOVERS getting just a little hungry? Some 23 firms grouped into 15 bidders to submit figures for The Bureau of Reclamation's 7-million yd earthfill Kerwin Dam on the North Fork, Solomon River, in Kansas. Contract was awarded to Texas Construction Co., 1909 N. Harwood St., Dallas, Tex., for $6,772,671. Second bidder was Winston Bros. Co. with $7,144,583. Trailing the list was the combination of Grafe-Callahan Const. Co., Floyd Shofner and B. G. Gordon, who apparently aren't so hungry, for they asked $12,394,970 for the job, almost twice the low bid. Even more startling, however, is the fact that 10 of the 15 bidders were under the engineer's estimate of $9,158,543. Cook Construction Co., Jackson, Miss., was low bidder, $966,150, for railroad relocation at Kerwin Dam.

MANY EARLY BILLS put into the Congressional hopper refer to construction. They range all the way from St. Lawrence Seaway authorization and a 10,000-mi federal built and operated superhighway system down to construction of post offices in local communities where the residents purchase government bonds equivalent to cost of their construction.

HIGHWAY JOBS get a big boost in steel allotments by CMP Reg. 6, which allows each road project in the country to self-authorize 25 tons of steel per quarter, far beyond former limitations per project.

SOME BIG CONTRACT AWARDS OF THE MONTH

Brown & Root, Box 3, Houston 1, Tex., have signed a contract with Haiti for development of the Artibonite River for irrigation, estimated to cost $15,000,000.

American Bridge Co., Frick Bldg., Pittsburgh, Pa., superstructure for Paseo Bridge across the Missouri at Kansas City, Mo., for city dept. public works, $4,090,512.

The Lumnus Co., 385 Madison Ave., New York, N. Y. 30,000 bpd refinery for Standard Oil Co. of Indiana at Mandan, N. D., $18,500,000.

H. A. Simmons, Ltd., 16 E. Hastings St., Vancouver, B. C., pulp mill at Evadale, Tex., for East Texas Pulp & Paper Co., $17,500,000.

John A. Johnson & Sons, Inc., 303 41 St., Brooklyn, N. Y., barracks and dormitories, McGuire Air Force Base, Wrightstown, N. J., for Philadelphia District, U. S. Engineers, $6,992,000.

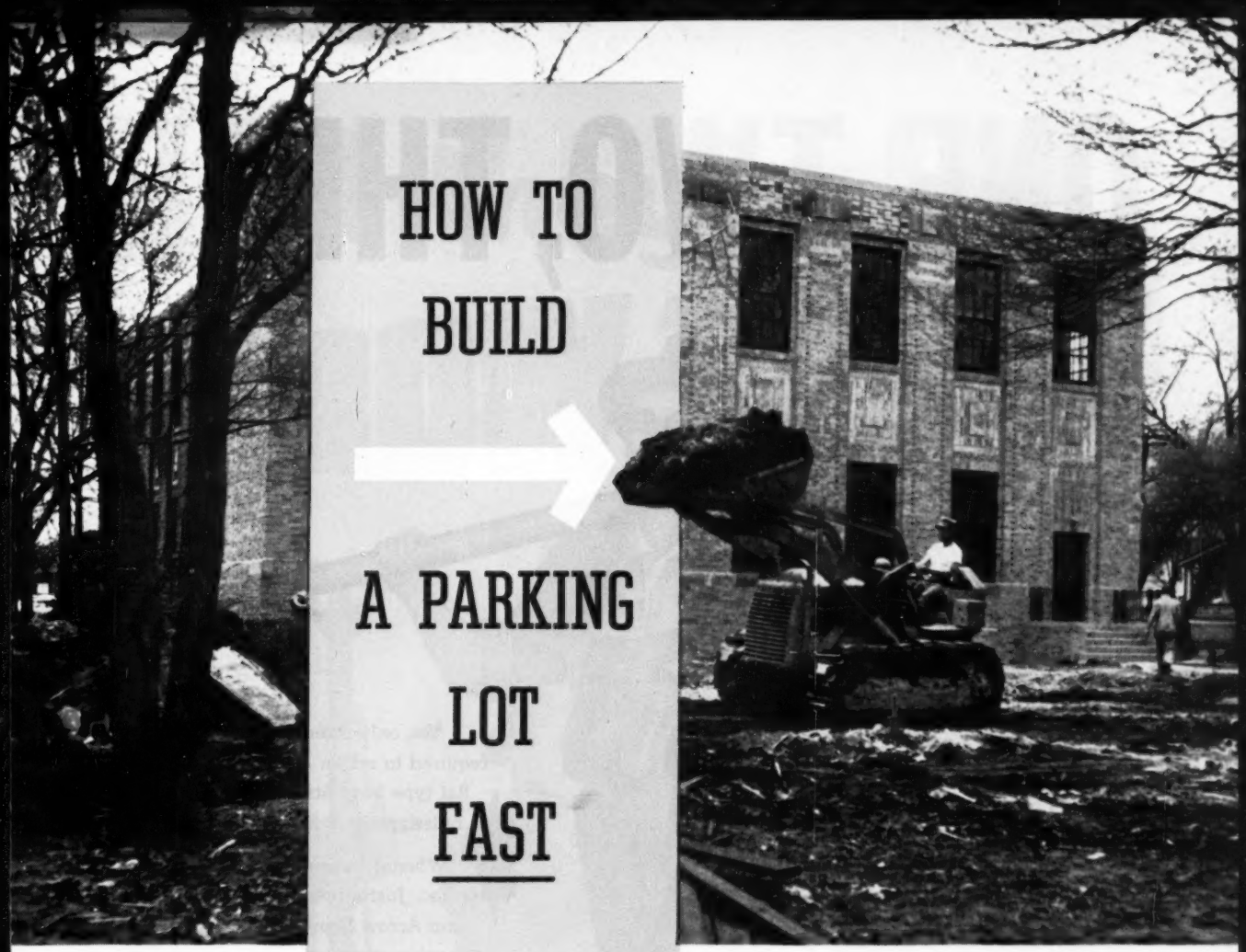
Kaufman Const. Co., 4000 Pulaski Ave., Philadelphia, Pa., market St. subway, city of Philadelphia, $3,197,006.

Bethlehem Steel Co., Bethlehem, Pa., twin bridges across Cuyahoga River, Cleveland, for Cuyahoga County, $4,637,790.

Bechtel Corp., 220 Bush St., San Francisco 4, Calif., addition to Kyrene steam plant, Tempe, Ariz., for Salt River Agr. & Power District, $13,500,000.

Raymond Concrete Pile Co., 13 St. James Ave., Boston, Mass, Pier No. 1, East Boston, for Port of Boston Authority, $4,658,670.

(*Continued on page* 20)



HOW TO BUILD A PARKING LOT FAST

This busy Caterpillar Diesel HT4 Shovel is clearing land in a hurry for an Ohio Bell Telephone Company parking lot in Cleveland. Contractor is Henry Miesz of South Euclid, Ohio.

The versatile Cat Shovel can get in and out of places bigger specialized equipment can't touch. Because its bucket is wider than any part of the tractor, it works close to walls and trees. The operator enjoys perfect visibility, too: all hydraulic connections are completely enclosed—no hoses or plumbing to interfere. It's a fast shovel . . . one that can raise and dump its bucket at the same time.

There's plenty of strength built into this machine, too. Its frame and mounting and lift arms are all welded and cross braced. The bucket has a heat-treated high carbon steel cutting edge. And there are 11,250 pounds of push at that cutting edge.

Like all Caterpillar machines, this shovel is a rugged, dependable, economical piece of equipment. Your Caterpillar Dealer will gladly demonstrate its advantages. He's the man to see, too, for service and for the genuine Caterpillar parts which guarantee you the kind of quality that's built into every one of these big yellow machines.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

ONE, TWO, THREE

WITH

Yes, only three quick, easy steps are required to set an Acrow Shore. Acrow's flat type head fits any size stringer. No redesigning of formwork is necessary.

When it comes to stripping, Acrow is faster, too. Just a twist of the collar handle and Acrow Shores are down, ready to telescope compactly. Collar threads are cleaned automatically during the stripping operation through Acrow's exclusive self-cleaning feature.

Acrow Shores are available with standard head 6″ x 6″; beam type, 14″ x 4″; or J head, 14″ x 4″. Working ranges . . . 3′ 4″ to 15″.

Write for complete information

ACROW, INC.
Dept. CM-2
510 No. Dearborn, Chicago 10, Illinois

ACROW

and they're UP

ACROW ADJUSTABLE STEEL SHORES

1 Lift inner tube to approximate height desired.
2 Insert Pin in nearest hole.
3 Turn collar handle for final accurate adjustment
1
2
3

MM WHEELERS
• Equipped for your job • easy to handle • high speed • large capacity • high engine torque at low rpm • durable single unit construction • low in cost • nearby parts and service
POWER! That's what you get with this MM loader unit—big-capacity lifting plus real power down-crowding performance.

MINNEAPOLIS-MOLINE MM MODERN MACHINERY

WHEELERS

COST LESS TO OWN . . . LESS TO OPERATE . . . and, they're HEAVY DUTY . . . ALL THE WAY!

You get ALL the benefits of Modern Manufacture when you specify MM Wheelers. Standardized, heavy duty parts and modern assembly procedures cost you less to begin with. Quality control in parts and assembly offers maximum precision for longer service on the job. And, those same efficient production methods permit special MM design features that give *better* loading performance—*greater* loading capacity.

Every day, more and more careful buyers are getting the facts from MM distributors . . . *buying* MM Wheelers for lower *first* cost—lower *operating* costs.

MINNEAPOLIS-MOLINE
MINNEAPOLIS 1, MINNESOTA

IT'S YOUR BUSINESS . . .

Continued from page 16

Some Big Jobs of the Month

Olson Const. Co., 410 S. 7th, Lincoln, Neb., hangars for Lincoln Air Force Base for Omaha District, U. S. Engineers, $3,062,198.

Arute Bros., Inc., 560 S. Main St., New Britain, Conn., 11.05- and 2.68-mi access roads, New York State Thruway, $5,446,552.

Blaw-Knox Co., Chemical Plants Div., 321 Pennsylvania Ave., Pittsburgh, Pa., chemical processing plant, Richland, Wash., for Atomic Energy Comm., $40,000,000.

Vaughan & Taylor Constr. Co., Inc., Wichita Falls, Tex., 43-mi, 16-in. welded joint crude oil pipe line from near Arden to near Eldorado, Tex., for Pan-American Pipe Line Co., $1,660,000.

Harmon Constr. Co., P. O. Box 1414, Oklahoma City, Okla., hospital addition for Baptist Memorial Hospital, Memphis, Tenn., $5,871,-987.

Winfrey Bros., Inc., 123 Burwell Ave., N. W., Knoxville, Tenn., additional 19 floors to Martin Brown office, Louisville, Ky., $4,000,000.

Grove, Shepherd, Wilson & Kruge, 2 Pine St., San Francisco, Calif., electric-electronics shop, Mare Island Naval Shipyard, Vallejo, Calif., $4,800,000.

W. E. O'Neil Constr. Co., 2751 Clybourn Ave., Chicago, Ill., superstructure on jet engine test cells, aircraft engine division at Chicago for Ford Motor Co., Dearborn, Mich., $4,500,000.

The Lane Constr. Corp., 37 Colony St., Meriden, Conn., 11.56 mi thruway and 5.31 mi access roads, New York State Thruway, $7,096,781.

S. A. Healy Co., 20 N. Wacker Dr., Chicago, Ill., earthwork, pipe line and structures for San Jacinto-San Vincente Aqueduct, San Diego, Calif. for U. S. Bureau of Reclamation, $6,798,101.

C. L. Hubner, 4200 Jewel Ave., Denver, Colo., 1.415 mi grading, structures, plant-mix oil-processed surf road for Denver County, $649,617.

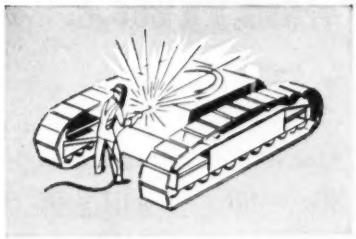
McGraw Constr. Co., P. O. Box 272, Middletown, Ohio, cold reduction mill, Ashland, Ky., for Armco Steel Co., Middletown, $12,000,000.

Before you buy:

SEE 'EM IN ACTION!

Ahl Bros. Constr. Co., Inc., Branchville, Md. own 5 Link-Belt Speeder draglines and back hoes, report "they're good machines."

Rugged construction, work-speeding features help you keep jobs on schedule, costs in line



More live weight—All-welded construction plus proper weight distribution provides extra strength without dead weight... resists impact and twist... simplifies field service.

WHY are more and more contractors specifying Link-Belt Speeders? Well, take the 30,000-lb. capacity LS-85 for example: It delivers 92 net hp at full load speed, has self-cleaning crawler treads, Independent Boom Hoist, not to mention outstanding stability. It's fast, maneuverable, yet takes the most rugged work with minimum maintenance.

Like the LS-85, every Link-Belt Speeder combines quality construction throughout with advanced design to speed your work, give you more per equipment dollar.

If you'd like details on this complete line of crawler, truck or wheel-mounted shovel-cranes, ask your distributor or write for Catalog 2373.

LINK-BELT SPEEDER CORPORATION
Cedar Rapids, Iowa

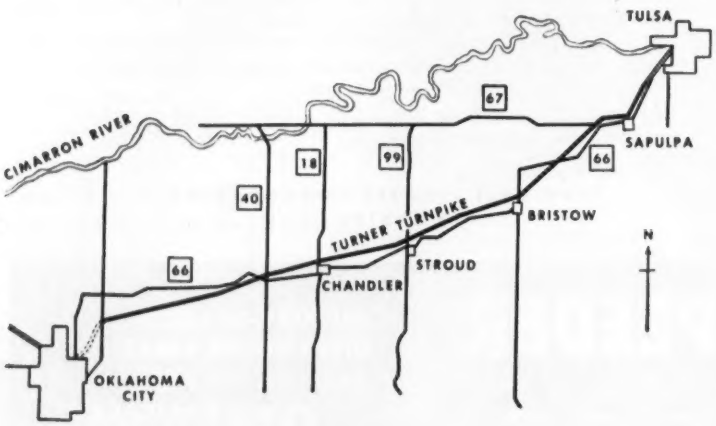
13,089

LINK-BELT SPEEDER
CORPORATION
BUILDERS OF A COMPLETE LINE OF CRAWLER, TRUCK AND WHEEL-MOUNTED SHOVEL-CRANES

FACTORY-TRAINED DISTRIBUTOR SALES AND SERVICE SPECIALISTS ...EVERYWHERE

Performance on the Turner Turnpike makes the Allis-Chalmers AD-40 Grader

A New Regular for Gillioz



One of the most modern highways in the Southwest will soon connect Oklahoma City and Tulsa, Oklahoma. Twin 24-foot roadways will save travelers almost a full hour of driving time on this 88-mile stretch; 12-foot paved shoulders, slight grades and long curves will make driving easier and safer, too.

Turner Turnpike in final stages of construction shows how it aims for horizon with arrow-like straightness. Right-of-way is 200 to 400 feet wide. Grades are maximum of 3 percent.

M. E. Gillioz, Monette, Missouri, was awarded three of the Turner Turnpike contracts; each for clearing, grading culvert work and fine grading. Gillioz, with half a century of experience in earth moving, has one of the largest contracting organizations with one of the biggest fleets of Allis-Chalmers tractors in the area. And now there's a new regular in the Gillioz fleet — an Allis-Chalmers heavy-duty AD-40 motor grader.

The AD-40 proved to Gillioz on his Turner Turnpike jobs that it represents real progress in motor grader design. His operators could see the front wheels and both ends of the blade well whether they were rolling big windrows or doing fine finishing. There are a number of reasons: (1) A-C's single member frame goes all the way from the front axle to the platform; (2) the front corners of the platform are tapered; (3) the size of the lift cases has been cut down to eliminate blind spots; (4) the control box has been lowered, and assemblies have been eliminated from the front panel to provide better visibility of the work area directly ahead of the operator.

Gillioz men also like the operating comfort built into the AD-40. It has ample leg room for stand-up operation. And for easy, comfortable sit-down work, the AD-40 has a seat that rolls forward at a touch plus an adjustable-height steering wheel.

These advantages teamed up with a new kind of power steering and outstanding service simplicity to make the AD-40 a new regular for Gillioz. It will pay you to consider putting this job-proved grader on *your* team, too. See your nearby Allis-Chalmers dealer soon for all the facts.

ALLIS-CHALMERS
TRACTOR DIVISION—MILWAUKEE 1, U. S. A.

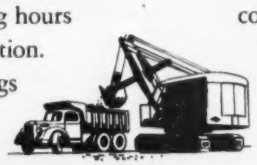
Allis-Chalmers AD-40 finish grades one stretch of the new turnpike. The completed highway will be divided by 15-foot landscaped center mall.

An HD-20, one of the Gillioz fleet of ten Allis-Chalmers torque converter tractors, sends a rubber-tired scraper off to the fill with a flying start.

ON RUGGED JOBS

Leveling hills to make way for a new housing project puts a terrific strain on "cats", dump trucks, shovels and other equipment. That's why so many leading construction companies make sure their engines are protected by heavy-duty T5X motor oil.

Even under the most *severe* operating conditions—dust, heat, heavy loads and long hours—T5X gives *superior* engine protection. T5X lubrication protects rings, bearings and other moving parts against wear, and greatly extends overhaul periods.



T5X is made from the finest base stocks plus an unusual combination of special-purpose compounds. Its active detergent additives protect against the clogging effects of sludge. Other special compounds in T5X keep the engine clean by retarding formation of lacquers and varnish.

Compare the performance of T5X with the motor oil you now use. You'll agree with construction men everywhere that T5X lubrication means less wear, lower maintenance costs and greater engine protection under *every* operating condition.

Contact your nearest distributor of T5X motor oil

Learn the money-saving story of heavy-duty T5X, the distinctive *purple* motor oil. Write or phone your nearest Union Oil Company office or T5X distributor and arrange for a trial supply.

DISTRIBUTORS

ALABAMA
- Graham Oil Company, Atmore
- Royal Oil Co., Birmingham

ARKANSAS
- Henley Oil Co., Fort Smith

COLORADO
- Pyramid Petroleum Co., Denver

CONNECTICUT
- Royal Distributors, Inc., Hartford

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- Sterling Auto Parts, Inc., Wilmington

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- Prior Tire Co., Atlanta
- Boss Oil Co., Augusta

ILLINOIS
- Haines Oil Co., Towanda
- Lake Shore Oil Co., Chicago
- Lohse Automotive Service, Rock Island

ILLINOIS (continued)
- Automotive Wholesale Co., Macomb

INDIANA
- J & D Distributing Co., Indianapolis

IOWA
- Inter-State Oil Co., Des Moines

KANSAS
- Inter-State Oil Co., Wichita

KENTUCKY
- EFoil Distributors, Louisville

LOUISIANA
- Petroleum Distributing Co., Houma
- Royal Petroleum Co., New Orleans

MAINE
- Darling's Inc., Bangor
- American Gear Co., Portland

MARYLAND
- C. Card Equipment Co., Baltimore

MASSACHUSETTS
- Holyoke Auto Parts & Equipment Inc., Holyoke
- Christie & Thompson, Inc., Worcester
- Detroit Supply Co., Inc., Pittsfield

MICHIGAN
- Mich-I-Penn Oil & Grease Co., Detroit

MINNESOTA
- Bulk Oil Co., Minneapolis

MISSOURI
- Inter-State Oil Co., North Kansas City
- Jenkin-Guerin, Inc., St. Louis

NEBRASKA
- Inter-State Oil Co., Omaha

NEW HAMPSHIRE
- Sanel Auto Parts, Inc., Concord

NEW JERSEY
- Cook & McGraw, Hackensack
- Hellmund Oil Co., Hillside

NEW YORK
- D & M Motive Parts Co., Staten Island

NEW YORK (continued)
- Davis-Howland Oil Corp., Rochester
- Detroit Supply Co., Inc., Albany
- Martin S. Golden, Inc., White Plains
- King & Falk, Inc., Pearl River
- Para Marine Distributors, Inc., Oyster Bay, L. I.
- Regal Oil Co., Ridgewood

NORTH CAROLINA
- Hickory Auto Parts, Inc., Hickory

NORTH DAKOTA
- Mann's Automotive Supply, Inc., Dickinson
- Gronvold-Blesener, Minot

OHIO
- Harrison Tire & Rubber Co., Cincinnati
- Lubriseal Lubricants Specialty Co., Cleveland
- Lewis Motor Mart Co., Dayton

OKLAHOMA
- Inter-State Oil Co., Oklahoma City

PENNSYLVANIA
- Miller Auto Parts & Service, Bethlehem
- E. Mather Co., Harrisburg
- Dick Wilson, Lewistown
- Alco Auto Parts, Inc., Philadelphia
- D. G. Nicholas Co., Scranton
- C. F. Mason Oil Co., Inc., Pittsburgh

RHODE ISLAND
- N. S. Potter Co., Providence

TENNESSEE
- Commercial Oil Co., Memphis
- Royal Oil Co., Nashville

TEXAS
- Allied Brands, Amarillo
- Hughston Oil Co., Dallas
- Petroleum Distributing Co., Houston
- Shipp Sales Co., Houston
- Industrial Lubricants Co., San Antonio
- Allied Oil Co., Tyler
- S & M Oil Co., Wichita Falls

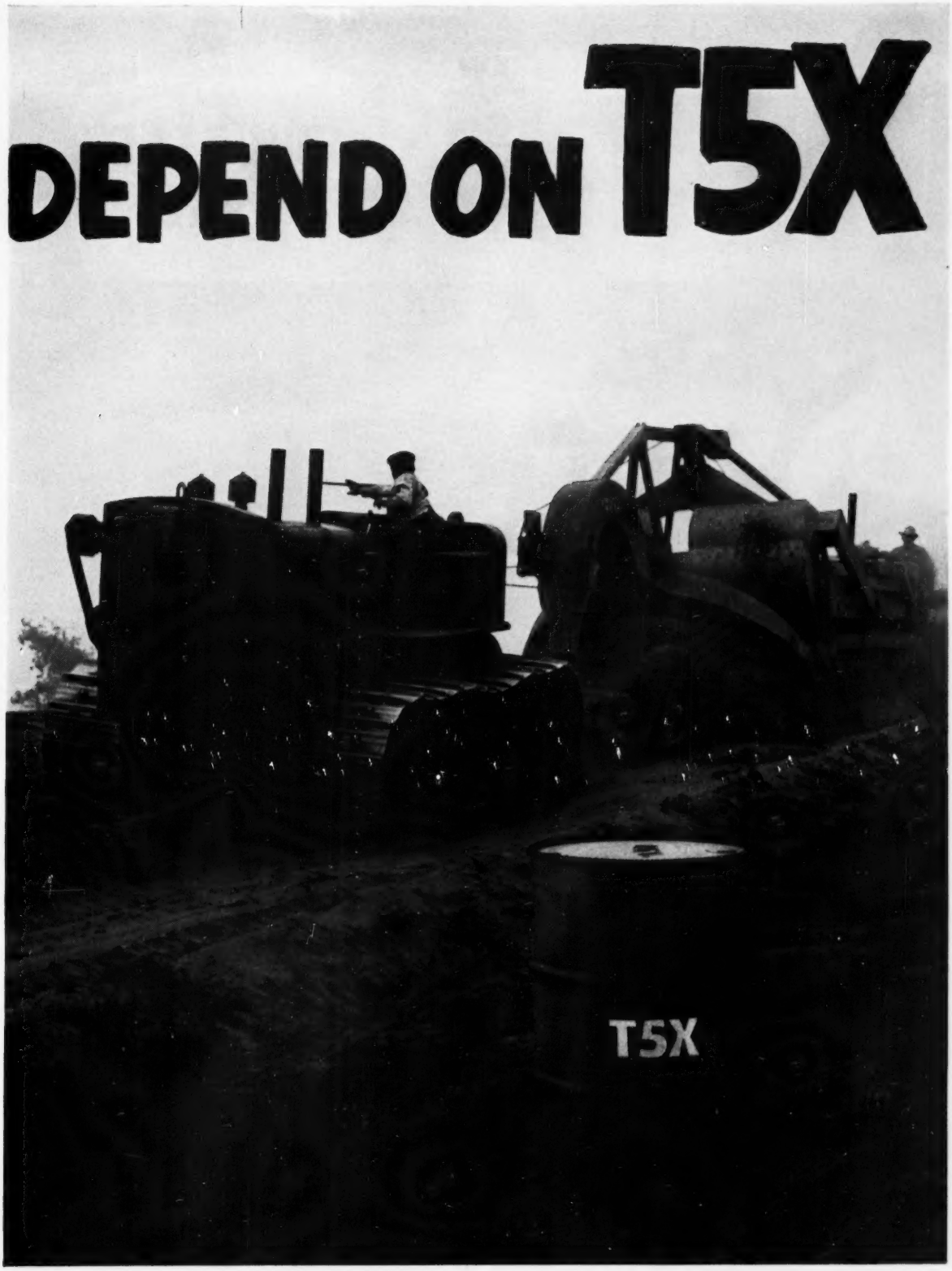
WISCONSIN
- Filmite Oil Corp., Milwaukee

OFFICES

LOS ANGELES: Union Oil Building • NEW YORK: 4904 RCA Building • CHICAGO: 1612 Bankers Building
CINCINNATI: 2111 Carew Tower Building • NEW ORLEANS: 917 National Bank of Commerce Building

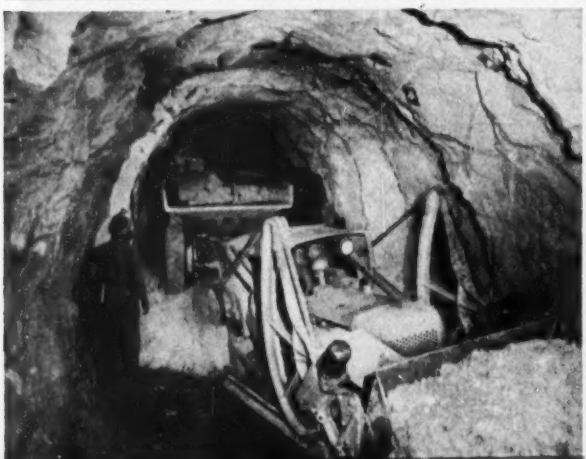
UNION OIL COMPANY OF CALIFORNIA

DEPEND ON T5X



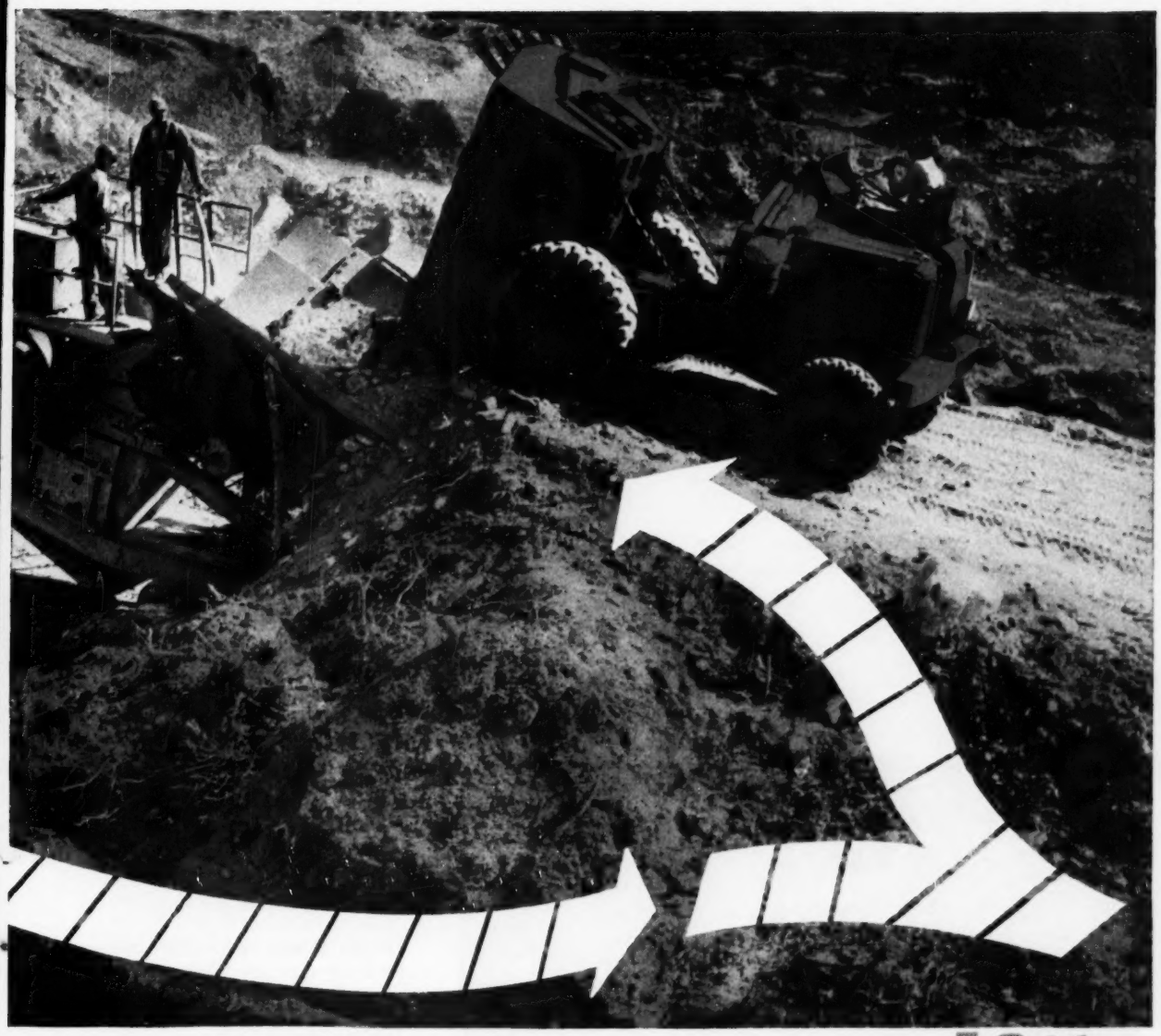
UNION OIL 76 COMPANY OF CALIFORNIA

NO-TURN SHUTTLE HAUL



In confined underground operation, fast-shuttling Dumpsters are ideal for no-turn hauling in tunnels and along narrow passageways. Also note how low rear entry to Dumpster body permits easy loading under low ceiling. Compact body is 5' x 5' for loading over end or sides.

This mountain-side job shows typical no-turn shuttle advantage. Hauling along narrow ledge, Dumpster spots close to Koehring 1½-yard 605 — gets its load, drives to fill, dumps, and returns to the shovel — without turning. Dumpsters are operated with equal ease in both directions. 8233



increases hourly output over 10%

With Koehring fast-shuttling Dumptors, there is no need to turn at the loading unit, along narrow haul roads, or at the dump. Koehring constant-mesh transmission gives the same 3 fast speeds forward and reverse. Every turn saved cuts 15 seconds off your cycle time, and adds up to a big increase in yards hauled per hour.

On a 1,000-foot haul, eliminating only 2 turns saves ½ minute every round trip. Where you would get an average of 13.6 trips per hour with 2-turn operation, Dumptor *no-turn shuttle hauling* gives you 15.4 trips. That's an increase of 1.8 trips an hour on the same, 1,000-foot haul.

Fast, easy spotting and 1-second gravity dump also help keep production high. Your Koehring distributor can show you many other cost-cutting advantages with heavy-duty, 6-yard Dumptors.

KOEHRING COMPANY, Milwaukee 16, Wis.

KOEHRING DUMPTOR®

Subsidiary Companies: JOHNSON • PARSONS • KWIK-MIX

NO BUGS! NO ORPHAN MODELS!
What's "new" in other compressors, Jaeger has built for 5 years

If you plan to buy a portable compressor, you now have 3 kinds to choose from:

1: Machines that still cling to the 20-year old ratings of 60, 105, 160, 210 and 315 ft., and are too small to run today's air tools efficiently.

2: New models offering, for the first time, the higher ratings which today's tools require.

3: Jaeger "Air Plus" Compressors which originated these higher ratings 5 years ago and guarantee them with the proved performance of more than 30,000 "new standard" compressors in the field.

No other compressors, new or old, yet give you Jaeger's features:

Balanced W-type 2-stage compressor in every size from 75 to 600 ft.

75% to 100% larger valves than in older type machines.

Positive lubrication by gear driven oil pump, standard in all models.

Bigger intercoolers and air receivers. Relief valve for automatic drainage standard in all models.

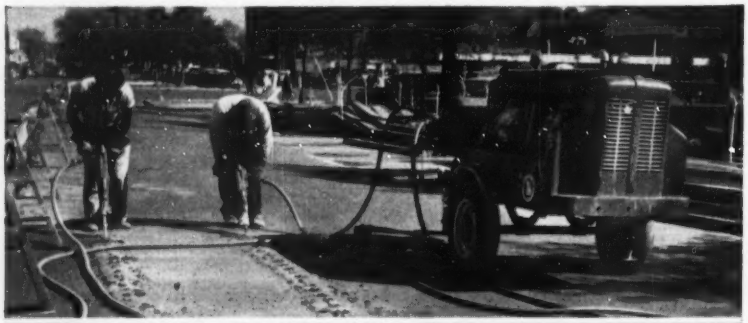
Bigger engines operated at conservative speeds, and bigger multiplate clutches than on any other compressors.

"Fuel Miser" control standard on all models where automatic regulation of engine speed means worthwhile fuel savings.

Lowest cost compressed air you can buy:

Prices of Jaeger compressors are, in every case, lower than those being asked for old standard compressors. Your cost per cu. ft. of air is many dollars lower because a Jaeger delivers 15% to 25% more air. And with this added air holding 90 to 100 lbs. pressure at the tools, instead of mere 70 lbs., you get 30% to 40% more production *with the same men and tools.*

Ask your Jaeger distributor to prove this. Or send for Catalog JC-1, which gives full data on compressors, tools and their air requirements — facts not published in any other catalog.



Jaeger Model 75 — the first compressor to operate one heavy pavement breaker efficiently.

Jaeger Model 125 — (illustrated) the first compressor to operate 2 heavy pavement breakers efficiently.

Jaeger Model 185 — the first compressor to operate 3 heavy pavement breakers efficiently.

Jaeger Model 250 — the first compressor to operate a 3½" wagon drill or 2 heavy rock drills efficiently.

Jaeger Model 365 — (illustrated) the first compressor to operate a ¾" nozzle sand blaster efficiently. Can also run a 4" wagon drill at full pressure with air to spare for plug-hole drilling.

Jaeger Model 600 — the first compressor to operate two 4" wagon drills or a 9B-3 heavy pile hammer efficiently. (Introduced in 1946, when all others built 500 ft. compressors.)

THE JAEGER MACHINE COMPANY

800 Dublin Avenue, Columbus 16, Ohio

PUMPS • CONCRETE MIXERS • TRUCK MIXERS • AGGREGATE SPREADERS • CONCRETE SPREADERS and FINISHERS

Everything you want in a road-builder

On the 35-mile access road to Dugway Proving Ground, in Utah, Olof Nelson Construction Co. used several kinds of "Caterpillar" equipment. But the machine that did much of the finishing work and helped complete the contract on schedule was a "Caterpillar" No. 112 Motor Grader.

Here are some of the features that make this unit an all-round road-building favorite:

1. *Every inch of it is "Caterpillar"-designed and built.*
2. *Weight, horsepower and speed are perfectly balanced for top performance.*
3. *Tandem drive assures constant power delivery and traction.*
4. *Mechanical controls provide instant, positive blade action in all conditions.*
5. *Constant mesh transmission makes shifting easy, fast and smooth.*
6. *Operator has a full view of the road, the blade and the job.*
7. *A complete range of blade positions gives the machine maximum versatility.*

The "Cat" No. 112 is built to handle every type of grader job from ditching, bank shaping and scarifying to oil mixing, fine finishing and maintenance. Get the full facts on this money-saving unit from your "Caterpillar" Dealer. He stands back of every machine he sells with genuine "Caterpillar" parts and reliable service.

CATERPILLAR TRACTOR CO., PEORIA, ILL.

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

Why the "Rigger's Pal" is the most popular jack with construction men!

The "Rigger's Pal" is the most popular jack with construction men because *it can use its foot as well as its head.* This rugged screw jack is available in 15, 25, 35, and 50 ton capacities, with raising heights of 10 to 13⅜ inches. It will not settle or creep under heavy loads even after long periods of time. Safety signal indicates when safe limit of raise has been reached.

For those heavy lifting jobs, bridge and wrecking work, moving heavy machinery and equipment, get the complete details on this and other Duff-Norton jacks. Call your distributor or write the world's oldest and largest manufacturers of lifting jacks for catalog 203T-1, The Duff-Norton Manufacturing Co., P. O. Box 1889, Pittsburgh 30, Pa. Canadian Plant—Toronto 6, Ontario.

DUFF-NORTON
Jacks

"Giving Industry A Lift Since 1883"

JOB TALK . . . Continued from p. 12

use fuse, blasting caps, electric blasting caps, or any other explosives that have been water-soaked, even if they have dried out. Consult the manufacturer.

DONT!

17. DON'T carry explosives in pockets of clothing.

18. DON'T make up primers of explosives in a magazine or near excessive quantities of explosives.

19. DON'T force cartridges of any explosives into a bore hole or past any obstruction in a bore hole.

20. DON'T allow explosives, or drilled holes while being loaded with explosives, to be exposed to sparks from steam shovels, locomotives, or any other source.

21. DON'T spring a bore hole near another hole loaded with explosives.

22. DON'T load a sprung bore hole with another charge of explosives until it has cooled sufficiently.

23 DON'T tamp with metallic bars or tools. Use only a wooden stick with no exposed metal parts.

24. DON'T use combustible material for stemming.

25. DON'T allow near the danger area of a blast any persons not essential to the blasting operations.

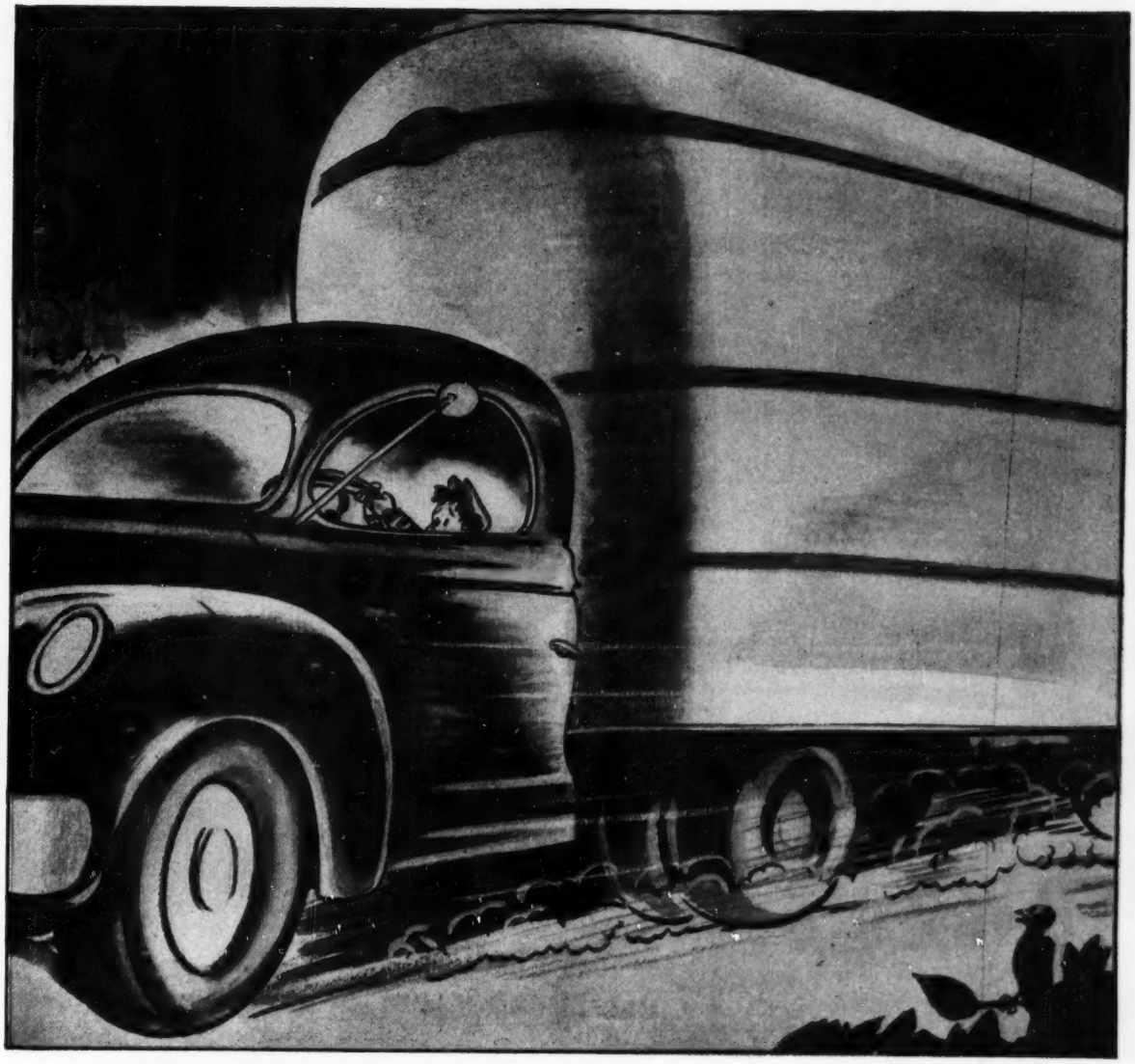
26. DON'T fire a blast until all surplus explosives are in a safe place, all persons and vehicles are at a safe distance or under sufficient cover, and until adequate warning has been given.

27. DON'T return to the face until the smoke and fumes from the blast have been dissipated by adequate ventilation.

28. DON'T attempt to investigate a misfire too soon. Follow all applicable rules and regulations, or, if no rules are in effect, wait at least an hour.

★ ★ ★

The remainder of the 66 "Don'ts" will appear under Job Talk in the March issue.



Don't send a boy to do a man's job!

MANEUVERING a trailer truck is no job for a boy. It's a *man-sized* assignment!

Lubricating a truck is another man-sized assignment. Your trucks need the protection of a tough, man-sized motor oil . . . one that bears up at high temperatures with heavy loads on long, hard runs.

Phillips *66* Heavy Duty Motor Oil is made from fine-quality crudes, specially selected, scientifically blended. These tough crudes are then carefully processed by "cold fractionation", a refining technique which preserves the exceptional lubricating quality of the oil.

Specially tested additives in Phillips *66* Heavy Duty Motor Oil guard engines against acid action, disperse carbon and sludge, protect against corrosion. For the whole story on the advantages of using this man-sized oil, ask to have a Phillips lubrication engineer call on you. Write to Phillips Petroleum Company, Bartlesville, Oklahoma.

Oil for the Engines of Commerce

Phillips 66

PHILLIPS 66 HEAVY DUTY MOTOR OIL

Ad No. 4740

DOMOR Elevating Grader

LOADS DW20'S

L. G. DeFelice & Son, Inc. use DOMOR on N.Y. Airport

Earl B. Yates, Field Superintendent, L. G. DeFelice & Son, Inc., reports: "The Domor far exceeded our expectations in stripping and loading. DW20's were loaded with 25 yards in 90 seconds."

Ninety seconds after a Cat DW20-W20 Wagon pulls beneath the conveyor of the Domor Elevating Grader, the heap-loaded rig is on its way to the fill. That's the production picture that L. G. DeFelice & Son, Inc., New Haven, Conn., is enjoying on an airfield project near Calverton, L. I., N.Y.

The Domor cuts and loads 25 yards of the sandy topsoil in 1½ minutes . . . the blade cuts smooth and the units work on undisturbed soil.

If you haven't seen a Domor Elevating Grader at work, ask your Caterpillar Dealer for information. He can tell you—and show you how the Domor out-produces bigger loaders at much less cost. Call on him.

ULRICH PRODUCTS CORPORATION, ROANOKE, ILLINOIS

DOMOR

ELEVATING GRADERS
ROAD WIDENERS
SNOW BLOWERS

Ulrich Products CORPORATION

ROANOKE, ILLINOIS

in WIRE ROPE, too, survival calls for the RIGHT KIND of muscle

Powerful, constrictive muscles give the python the crushing strength that enables him to exist under the grim rules of jungle law—where only the fittest survive.

Same way with wire rope. Here again, ability to last under adverse conditions demands the right kind of muscle. Bending Fatigue . . . Shock Stress . . . Abrasion . . . Load Strain—each demands wire rope that best combines the required resistance factors to overcome the destructive forces encountered in different types of service.

Complete quality control from ore to finished rope; long experience and specialized know-how — these are your assurance that in Wickwire Rope you always get the right construction . . . the right grade of steel and size of wire for long-lasting reliable service on your particular job.

See your Wickwire Rope distributor or contact our nearest sales office.

THE COLORADO FUEL AND IRON CORPORATION—Abilene (Tex.) • Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
THE CALIFORNIA WIRE CLOTH CORPORATION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) • New York • Philadelphia

WICKWIRE ROPE
A CF&I PRODUCT

A YELLOW TRIANGLE ON THE REEL IDENTIFIES WICKWIRE ROPE

WICKWIRE ROPE

CF&I

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

9684

GM Diesel-powered Allis-Chalmers AD-4 Motor Grader Building a Secondary Road in Far Northwest.

THIS IS THE DIESEL

for any job from 16 H.P. up

You can put this rugged General Motors Diesel to work wherever you are now using gasoline engines—on jobs from 16 horsepower up—and cut your fuel and maintenance bills 40% to 70%.

You'll get more work done because this engine is two-cycle—delivers power at *every* piston downstroke, not every *other* downstroke as do four-cycle Diesels. This makes it smoother running and far more powerful for its size.

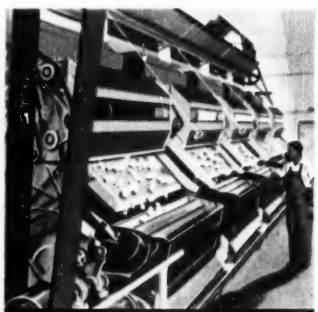
The GM Diesel is simple to operate. It starts quickly. It burns fewer gallons of safer, lower-cost fuel. And it runs for years with a minimum of maintenance.

The savings a GM Diesel can make in *your* operation are more than ever important to you today. If you need new equipment, be sure to specify GM Diesel power. If you have a piece of machinery that could use a new lease on life, write us or see your GM Diesel distributor today.

Single Engines . . . 16 to 275 H.P. Multiple Units . . . Up to 840 H.P.

DETROIT DIESEL
ENGINE DIVISION
GENERAL MOTORS • DETROIT 28, MICHIGAN
In Canada: General Motors Diesel, Ltd., London, Ontario

GM GENERAL MOTORS DIESEL POWER



Minimize **PITTING**

Eliminate **PATCHING**

Insist on **GLOBE FORM GREASE**

The Wonder Grease for Concrete Forms

REGARDLESS of whether you use steel or wooden forms for concrete work — you can apply Globe Form Grease by spray, brush, or swab. This time-tested paste emulsion will reduce peeling and pitting to a minimum when forms are removed, and practically eliminate patching.

Due to its special adhering qualities, Globe Form Grease requires only a thin coating for utmost effectiveness. In fact, one gallon adequately covers approximately 200 square feet! And in addition — Globe Form is stainless, leaves a whiter smoother surface, and eliminates the need for painting.

Why not write for full particulars today? Once you use Globe Form Grease, you'll understand why engineers and contractors hail it as the "wonder grease" for concrete forms.

OILS and GREASES
for every purpose
DIESEL
STEAM
AUTOMOTIVE

Write for descriptive booklet of all Borne, Scrymser products.

BORNE SCRYMSER Since 1874

Our Laboratory Facilities are always at your disposal

BORNE, SCRYMSER COMPANY ELIZABETH, N. J. • CHARLOTTE, N. C.

Spot

MORE LOADS

★

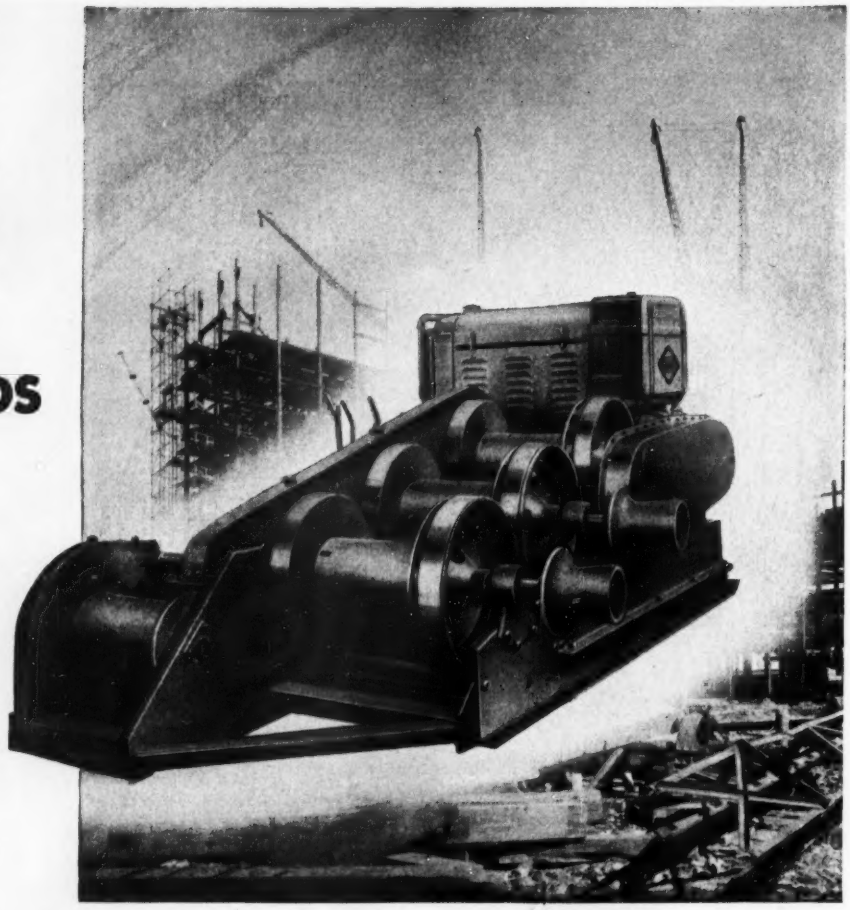
FASTER

★

EASIER

★

SAFER!



with a

CLYDE HOIST

The ease of operation of Clyde Band Friction Hoists permit the operator to concentrate all of his attention on the *safe, sure, accurate* spotting of loads. Convenient and easily-operated controls practically eliminate fatigue . . . and the consequent slowing down and dangerous operations by a tired-out operator. *Smooth, positive* engagement and release eliminate shock loads on cable and hoist and give *split-second control* at all times!

Clyde Band-Friction Hoists are available in one, two and three drum models with nominal line pulls to 21,000 lbs. and line speeds to 400 f.p.m.

Circular MP-48 gives complete information and specifications on these hoists . . . time savers and money makers for all construction jobs. *Write for it TODAY!*

Clyde Internal Friction Bands Dissipate Heat
FASTER, LAST LONGER, ADJUST EASIER!

Friction bands on Clyde Hoists are inside the friction drum, thus permitting the heat to be carried away as it is generated — something impossible when the band surrounds the outside of the drum and virtually forms an insulating blanket around the heat generating surfaces.

At those infrequent times when adjustment needs to be made, it can be done simply and quickly! FRICTION LININGS CAN BE REPLACED WITHOUT REMOVING THE DRUMS! Check all the advantages of a Clyde Band-Friction Hoist before you purchase ANY hoist!

WHIRLEYS • DERRICKS • HOISTS • BUILDERS TOWERS • CAR PULLERS • HANDI-CRANES • ROLLERS

CLYDE

ESTABLISHED 1899

CLYDE IRON WORKS, Inc.

DULUTH 1, MINN

Subsidiary of Barium Steel Corp.

practical pointers...

on choosing the right instruments for your job

Now you can choose from *two different lines* of Berger Instruments, the type that best fits your day-to-day surveying needs—from the simplest home and road building to the most exacting first-order surveying projects. For now, Berger makes both moderate-priced Builders and Contractors Instruments and its world-famous Engineers' Transits, Levels, Alidades, Theodolites and Astronomical Instruments.

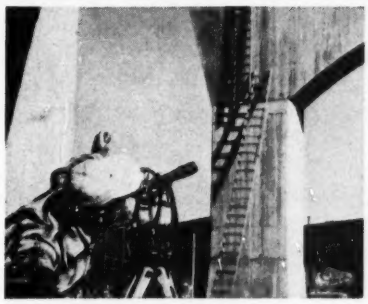
Whatever your surveying need, there's a Berger to do it Better—like those illustrated here.

You may have descriptive literature on these and all other Berger Instruments, on request. Write today.

For Roads ... Home Building ... and similar construction ...

laying out and measuring horizontal and vertical angles, leveling, measuring differences in elevation, setting building lines and batter boards, lining up engine beds, plumbing walls and columns, use the sturdily built, moderately priced Berger Convertible Transit-Level. 12-inch erecting-internal focusing hard bronze telescope. Rack and pinion adjustment. 22 power coated optics. Steel spindle. Horizontal and vertical vernier readings to 5 min. Dust-protected axis bearings, leveling, tangent and clamp screws. Mahogany transit case.

Write for details of Berger 12" Dumpy Level and Builders' and Farmers' Service Transit-Level.



For Exacting Assignments ... Highways, Dams, Bridges ...

the Berger Engineers' Transit. Horizontal circle has double opposite verniers reading to minutes, 30 seconds or 20 seconds; verniers are offset to line of sight and provided with reflectors. Protected vertical circle has double vernier. Graduations on Sterling Silver. Erecting-internal focusing telescope. Smooth-acting leveling and tangent screws; level vials readily visible. Large bearing areas on centers and clamps. "R" type equipped with compass, yoke standard and wye bearings.

Write for "Accuracy in Action" describing other Berger Transits; Dumpy, Wye, and Precise Levels; Up- and Down-sighting Vertical Collimators; Jig Collimators; Alidades; Mining and Astronomical Instruments.

For Contractor's Field Office — Complete Drafting Kit ...

New Berger Drafting Kit combines all necessary drafting instruments and supplies in one easy-to-carry case. It includes your choice of complete 14-piece professional type drawing set or master bow pencil or interchangeable bow with ruling pen—all in velvet-lined case—plus protractor, architect's scale, engineer's scale, 8" and 10" triangles, French curve, draftsman's tape, pencils, pencil pointers and erasers. Inner compartments hold drawing and note papers—all in attractive, durable, 16" x 24" simulated leather zippered carrying case of scuffproof, waterproof Texon—with slide-in type handles.

Ideal for field or office use—and at home, too. Issue it, get it back intact. No lost or strayed equipment. Write for prices.

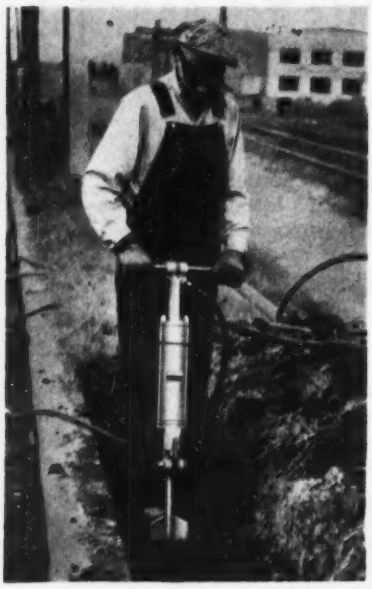
C. L. BERGER & SONS, INC., 37 WILLIAMS STREET, BOSTON 19, MASS.

Engineers' Transits
Builders' Instruments
Levels
Alidades
Theodolites

THE BEST IN SIGHT IS BERGER

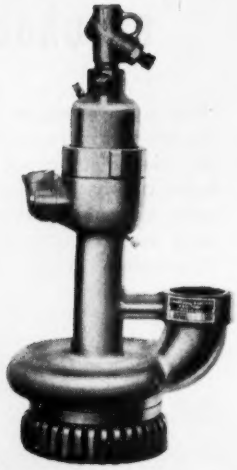
ENGINEERING AND SURVEYING INSTRUMENTS ... SINCE 1871

AIR POWER *speeds trenching jobs*



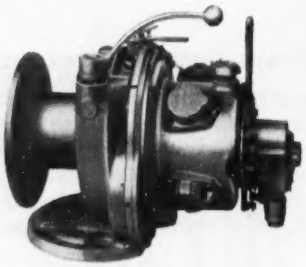
faster work..... lower costs

DIGGERS—One man operating an Ingersoll-Rand Digger loosens more material than six or eight men using ordinary hand methods. Six sizes are available, ranging in weight from 19½ to 37⅝ pounds.



SUMP PUMPS—An Ingersoll-Rand Sump Pump should be kept on hand for all trenching jobs. In cases where water problems arise the immediate application of a Sump Pump means the difference between profit and loss. Two sizes are available, the Size 25 and the Size 35.

with these **4** AIR TOOLS



UTILITY HOISTS—Ingersoll-Rand's Utility Air Hoists are used effectively for backfilling, pipe and material handling. These Hoists can be mounted in any position—pole and column mountings are also available. There are twenty sizes having single line capacities up to 3500 pounds. Capacities may be increased many times with sheave blocks.—A little air goes a long way with these popular Hoists.

BACKFILL TAMPERS—Ingersoll-Rand's Backfill Tampers are one of the contractor's greatest time saving tools because the Tamper not the man does the work. They provide a solid fill with no subsequent ground settlement and they are easy on the operator.

GYRO-FLO
Ingersoll-Rand *Rotary* Mobil-Air

Ingersoll-Rand's latest rotary, portable Air Compressor—Four models—105, 210, 315 and 600 cfm at 100 pounds full rated air pressure.

Ingersoll-Rand
11 BROADWAY, NEW YORK 4, N. Y.

804-A-18

IR CONTRACTORS' COMBINATION

PUMPS • CONDENSERS • AIR AND ELECTRIC TOOLS • ROCK DRILLS

The rope won't suffer long. First the stretch, then the "bang" as it breaks. Tough on the rope—but it gives us vital information!

Check and test . . . check and test

In the making of Bethlehem wire rope, quality control is a fundamental point. It is a factor as basic as proper design; it is the core, the heart, of our careful manufacturing methods.

Throughout this program of quality control, many different tests are employed, for no single test will suffice. The one shown here is an excellent example —one that is cruel to the rope but that yields vital facts.

Offhand, you wouldn't think that any machine could possibly break that big, stout Bethlehem rope. It is made of tremendously strong steel wires, and it will lift or support many tons. Yet the machine pictured can break the rope in a matter of seconds. Object: to establish the ultimate tensile strength of the rope.

This rigorous treatment is all part of our overall formula. From open hearth to finished rope, it's check and test, check and test. Nothing is left to chance. Because of this attention to detail, you can depend upon Bethlehem rope to do the job expected.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

When you think WIRE ROPE . . . think BETHLEHEM

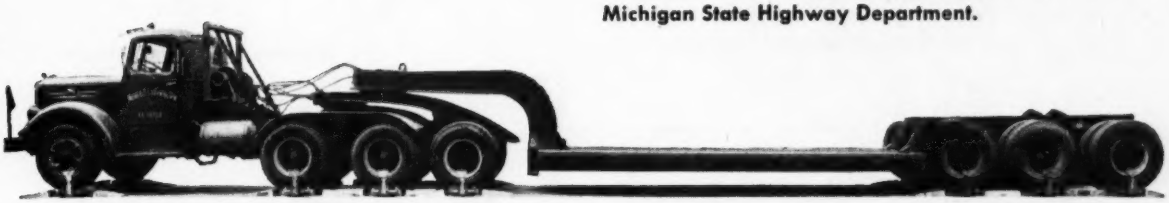
Just to Remind You

BUTLER PLANTS
also are
magnificently designed
- - - - and they
step lively, too!

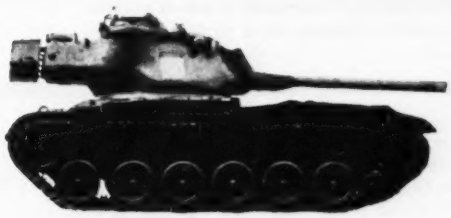
BUTLER BIN Company, Waukesha, Wis.

Here is Proof of LOAD DISTRIBUTION

The figures given in this ad were scaled at the Centerline Tank Plant, Detroit, Michigan by representatives of the Weightmasters Division of the Michigan State Highway Department.

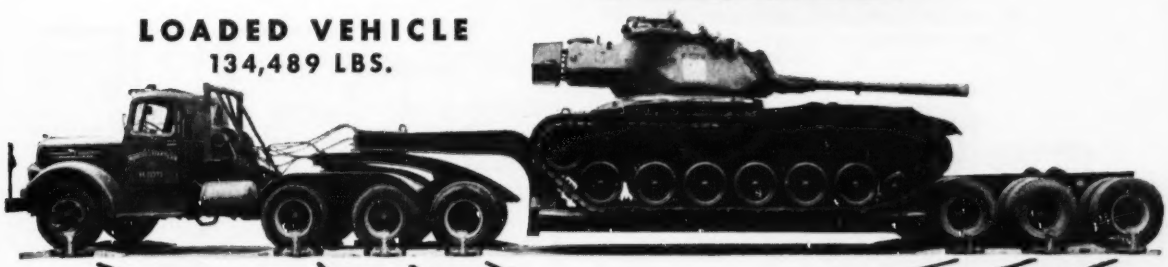


EMPTY VEHICLE
41,340 LBS.

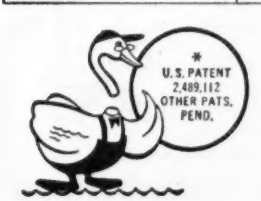


WEIGHT OF LOAD
93,149 LBS.

LOADED VEHICLE
134,489 LBS.



AXLE NO. / AXLE WEIGHT—LBS.	1	2	3	4	5	6	7	TOTAL WEIGHT
EMPTY VEHICLE	81% 8220	37% 7660	36% 7440	24% 4920	22% 4420	20% 4450	20% 4230	30% 41,340
WEIGHT OF LOAD	19% 1820	63% 13100	64% 13040	76% 15270	78% 15870	80% 16909	80% 17140	70% 93,149
LOADED VEHICLE	10040	20760	20480	20190	20290	21359	21370	134,489
TIRE SIZE	10:00	10:00	10:00	10:00	11:00	11:00	11:00	
NO. TIRES	2	4	4	4	4	4	4	26
TOTAL TIRE WIDTH	20	40	40	40	44	44	44	
AXLE SPACING	1 to 2 11 ft. 6 in.	2 to 3 4 ft. 6 in.	3 to 4 4 ft. 0 in.	4 to 5 25 ft. 1 in.	5 to 6 4 ft. 1 in.	6 to 7 4 ft. 3 in.	FIRST TO LAST 53 ft. 7 in.	



THE TALBERT CONSTRUCTION EQUIPMENT CO., of Lyons, Illinois manufactures a complete line of low-bed trailers and dump semi-trailers

THE TALBERT-WAY IS THE EASY WAY

4 easy ways to hang forms

UNIVERSAL Products . . "TOPS" IN CONCRETE FORMING

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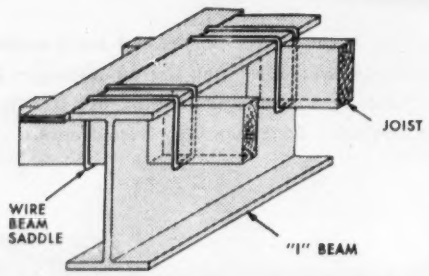
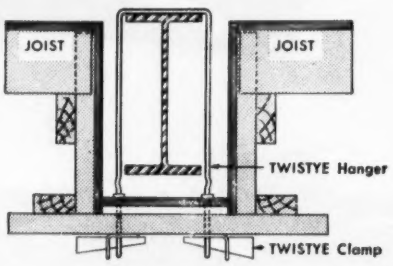
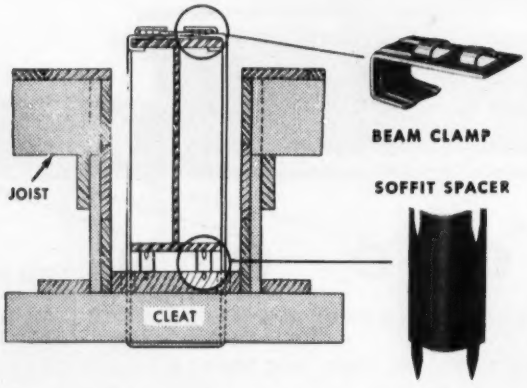


1 **Wire Beam Saddles**—For non-fireproofed construction . . . bridges, overpasses, etc. Saddles are accurately made to insure correct relationship between deck form and beam flange.



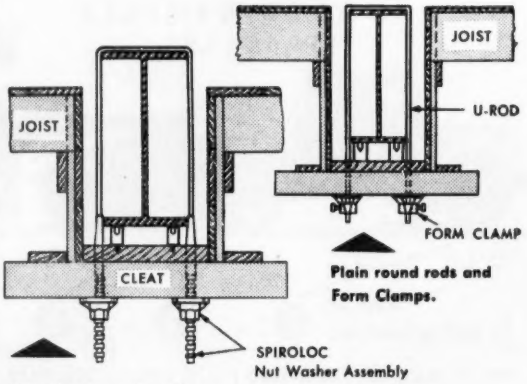
2 **TWISTYE Hangers**—For fireproofed construction . . . accurately fabricated to provide a positive spreader . . . guaranteed breakback . . . easy installation, quick removal.

3 **Beam Clamps with Band Iron and Soffit Spacers**—For fireproofed construction . . . Beam Clamp has a double grip on Band Iron which develops the band's full strength. Soffit Spacers act as spreaders. Installed from above . . . no scaffolding necessary.



Send your hanging problems to us!

4 **"U" Bolts**—For fireproofed construction. Recommended where hangers must carry heavy loads.



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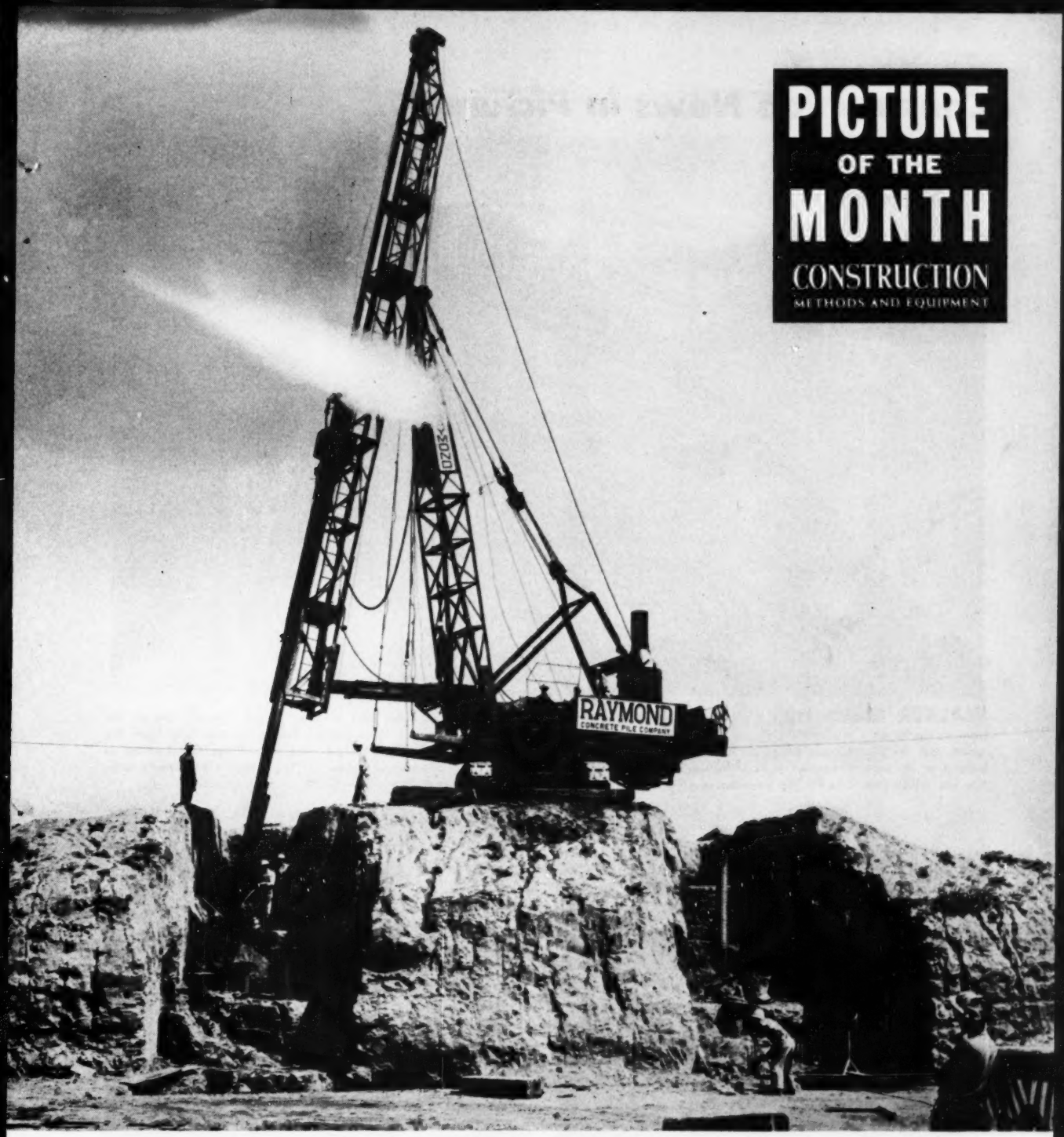
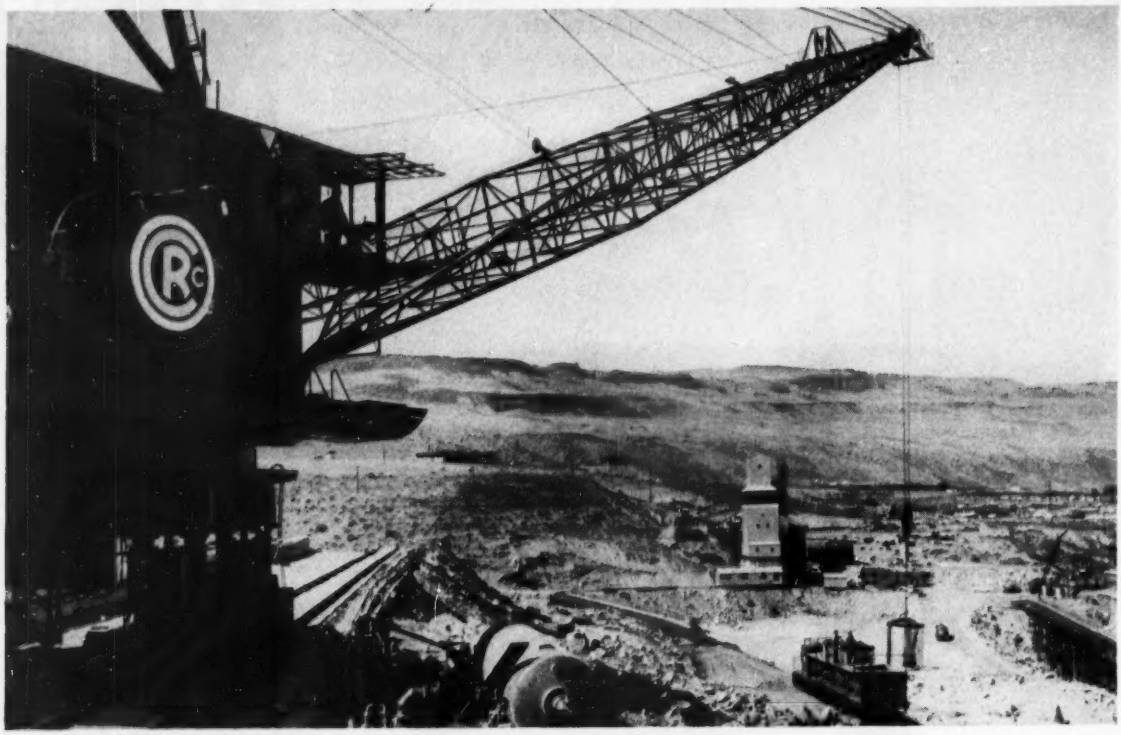


PICTURE OF THE MONTH
CONSTRUCTION METHODS AND EQUIPMENT

Big Rig Pays Off on Small Job

PERCHED HIGH ON A CHUNK of California ground, this big universal piledriver places 1-in-3 batter piles for the wing walls of Almansor Street Overpass of the Ramona Freeway at Alhambra. Raymond Concrete Pile Co. used the big rig instead of a smaller skid-mounted unit because of the complexity of pile clusters. Piles are on five levels and include units battered out and others battered in. The latter were driven by booming the leads out. A skid-mounted driver would have required excessive cribbing. The big machine on crawlers swung around the job easily, driving with a standard No. 1 Raymond hammer with 5,000-lb ram. It placed 602 step-taper piles averaging 18 ft on this project for the California Division of Highways. Griffith Company, Los Angeles, is the contractor.

Construction News in Pictures...



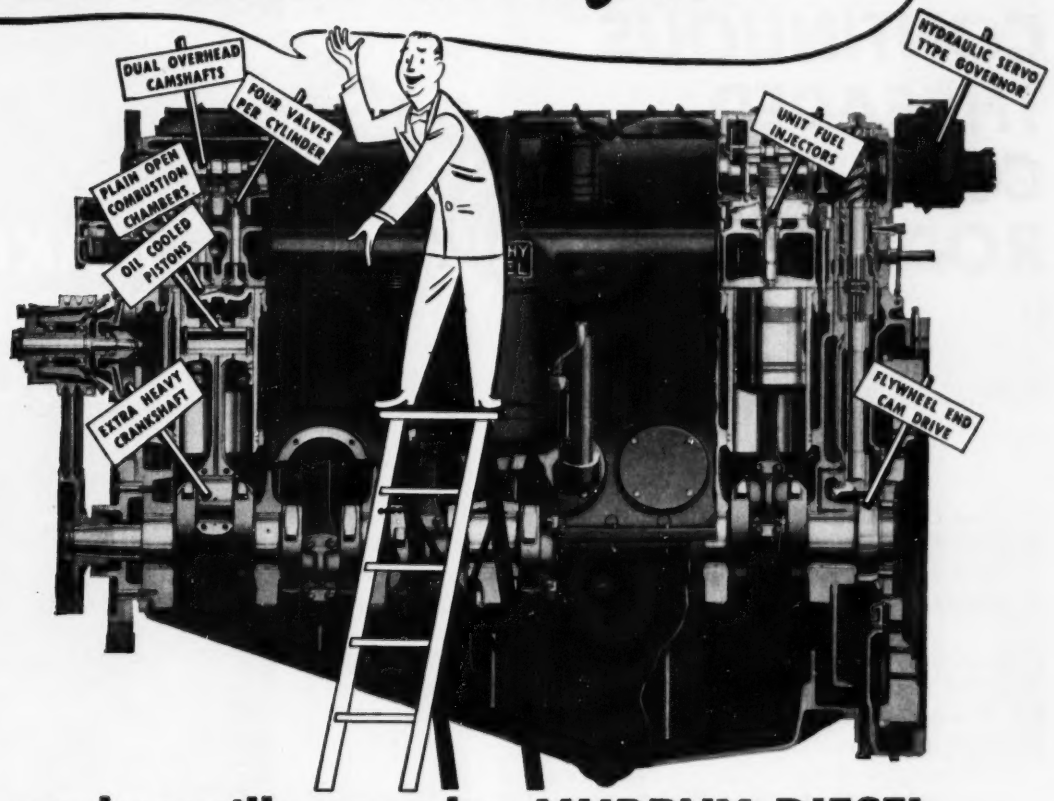
WALKER RIDES HIGH—That's a 200-ft boom, and from its tip hangs a 4-yd bucket of concrete. Quite a load at that radius, but the big Bucyrus Monighan dragline, traveling on rails instead of its walkers, handles it in stride while placing concrete into the intake structures for the powerhouse at Chief Joseph Dam on the Columbia River near Brewster, Wash. The rail car on the lower level brings up three loaded buckets at one time from the batch plant in the background. Columbia River Constructors is building the powerhouse under a $39-million contract—to provide for 17 generating units.—Corps of Engineers photo

STEEL SKELETON—Construction is being pushed on the Bayshore Freeway viaduct in downtown San Francisco. Here workmen guide into place steel members brought up by crawler crane. The viaduct, .7 mi long, separates into different elevations in the distance to accommodate a future crossing. Elevated section connects two isolated freeway sections.—Wide World photo

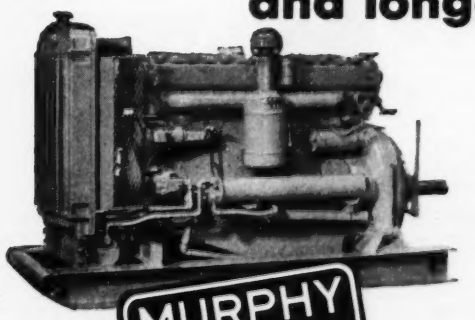
SPECIAL DELIVERY—Tournadozer weighing 17 tons is backed up ramp into an Air Force Globemaster cargo plane somewhere in Japan for a quick trip to Korea. Seven of these big dozers were airlifted in two days to finish an airfield before winter weather clamped down. A large fleet of these agile units is serving the Air Force and Army Engineers in Korea.—Air Force photo

(Continued on page 47)

Look inside the engine...



and you'll see why MURPHY DIESEL gives you more power, greater economy and longer engine life...



MURPHY DIESEL

Heavy duty power

for construction

Murphy Diesel Engines and Power Units for construction, 90 to 226 H.P., 1200 and 1400 RPM. Generator Sets, 60 to 140 K.W.

FOR the most part, engines look pretty much alike from the outside, but to really judge an engine you have to look inside. The Murphy Diesel isn't afraid of comparison. It offers a combination of proved design advantages available in no other engine. Check these features for yourself and ask Murphy Diesel owners—they'll tell you what these features mean in terms of good heavy-duty power, minimum fuel consumption and long engine life.

Additional information is given in the booklet, *"10 Questions to Ask a Diesel Engine Salesman"*. Ask your Murphy Diesel Dealer for a copy or write direct.

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SUPERIOR

CONTINUOUS THREADED COIL RODS . . .

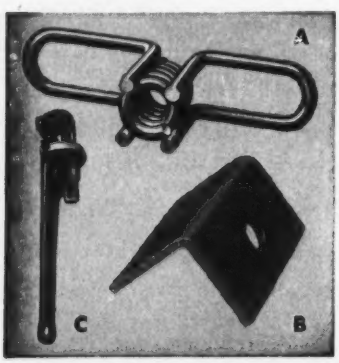
. . . MAKES DIFFICULT TYING JOBS *Easy* . . . . .

Superior Continuous Threaded Coil Rods, with or without Coil Wing Nuts and Corner Brackets, are a valuable supplement to Superior Coil Ties and standard working parts when job conditions are unusual or difficult.

In three typical applications, shown at the right, these Continuous Threaded Rods are used; (1) to tie form corners; (2) as an anchor rod tie down and as coil bolts; and (3) as a coupling for two coil ties providing an adjustable form tie.

Available in ½", ¾", and 1" diameters and in any length up to 10 ft., Superior Continuous Threaded Coil Rods in quantities can be cut to length on the job with a heavy-duty hand Coil Rod Cutter.

Superior Continuous Threaded Coil Rods are the answer to unusual or difficult tying problems. When you use Superior you are assured of the *best* in design, material, and workmanship.

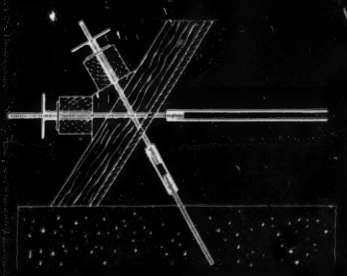


A-COIL WING NUTS
Coarse helix coils form the threads. Easily applied and removed from rod. Develops maximum capacity of rods.

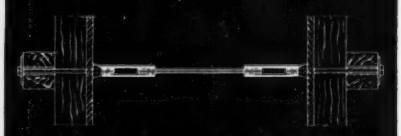
B-CORNER BRACKET
An *exclusive* Superior feature. Provides simple, efficient method of tying form corners and bulkheads.

C-SPECIAL COIL ROD WRENCH
Heavy-duty Stillson type wrench with special jaws for gripping and turning Coil Rods with least damage to threads.

ON FORM CORNERS



FOR ANCHORAGE



AS AN INTERNAL TIE
Two Coil Ties and a length of Coil Rod make an adjustable form tie and spreader.

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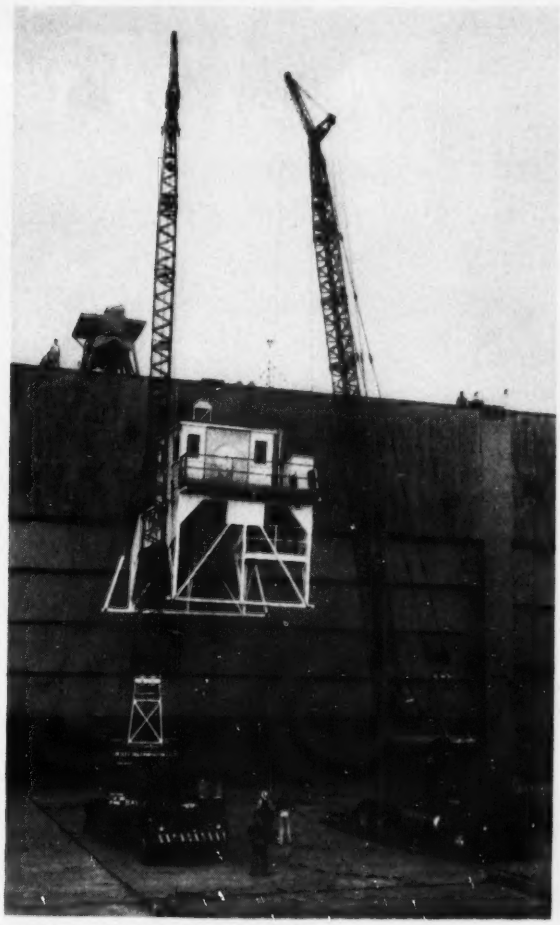
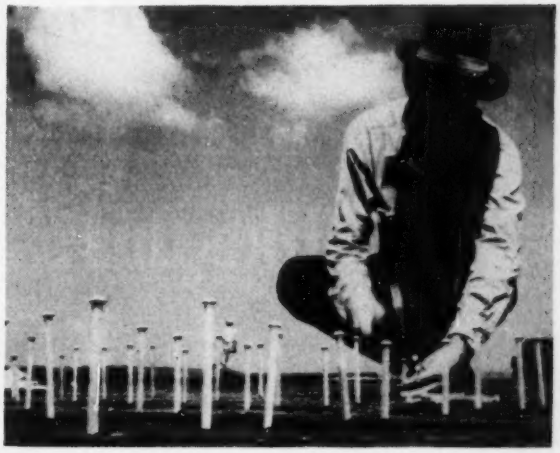
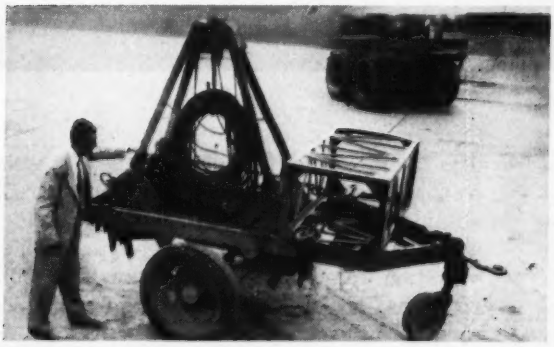
REQUEST A COPY OF OUR NEW CATALOG 500 . . .
It contains a valuable table for spacing studs, wales, and form ties.



TWO ON THE HOUSE— A 7-ton antenna range building containing $30,000 worth of radar and other electronic equipment is lifted from the top of a 60-ft hangar at Long Beach, Calif., for the Douglas Aircraft Co., by two 20-ton Bay City truck cranes each with a 90-ft boom. One had a 30-ft jib, the other a 20-ft jib. The crane on the right appears to be fueled by LP gas. Job was done by K. H. Chesley Transportation Co., Long Beach.



CHIPS AND SPIKES— Freeport Sulphur Co. is building a new plant on the marshlands of Louisiana. Above, workmen are tapering some of the 2,163 supporting piles driven down 85 and 90 ft. Wooden floor will be covered by a 16-in. concrete mat to support a series of concrete cells on which the main plant floor will be built. At top, workman is setting aluminum spikes in drilled holes in elevated plank road. Sledge hammer will drive them.



TRAILER CARRIES SPARES— A utility company in Oakland, Calif., during construction of access lanes to a freeway, ran into repeated interchange of boom lengths and bucket sizes for ditching work. A three-wheel trailer now follows the job, carrying a boom section and the clamshell currently idle.

BOTTOM UP— About the only real damage here was to the operator's pride. P&H crane had been working on an incline while cleaning out a pond and the operator boomed out too far, causing it to topple. The crane is owned by Taylor Excavating Co., St. Louis County, Mo.—Suburban Equipment Co. photo

When you blast in an area like this...

Roadway near gas storage tanks.

Adjacent residential area.

Parking lot below roadway.

Instrument factory opposite blast area.

ABOVE are some of the blasting problems that faced the Central Pennsylvania Quarry, Stripping and Construction Company on By-pass Route 22 through Easton, Pa. The highway passes gasoline storage tanks, business establishments, homes, a cemetery, a precision instrument factory and a parking lot full of cars. As a result, maximum control was imperative. Flying rock had to be minimized, yet good displacement was needed for easy digging.

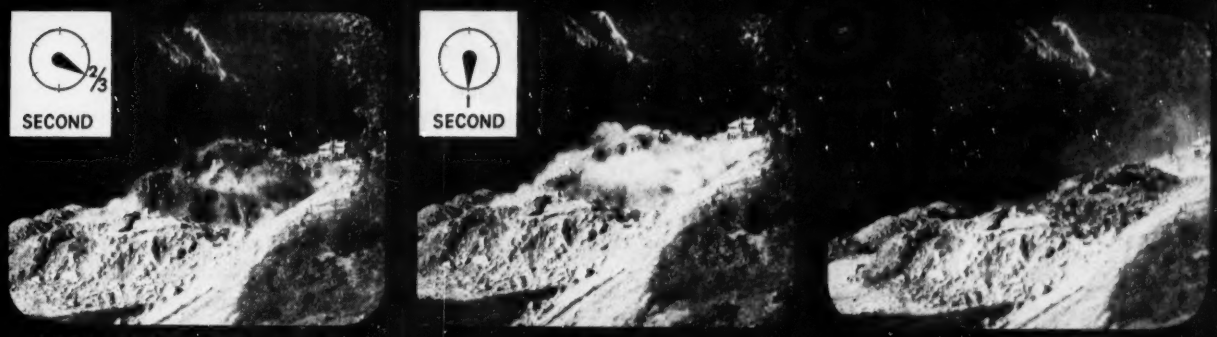
The results of the ROCKMASTER blasting system on this job speak for themselves. The contractor obtained efficient use of force, controlled throw and maximum breakage. Noise, flying rock and vibration were kept to a minimum. The broken rock was blasted *toward* the slope and not scattered into the valley below.

When you have shooting problems like this, ROCKMASTER can help you, too. Literature is available.

Rockmaster® can help you like this...

1. One section of the roadway 100 holes loaded and ready to shoot.

2. Burden receiving full power of the explosives. Flying rocks eliminated.



3. Peak of blast. Confinement excellent. Burden moving up slope.

4. Full second after detonation. Gases appear but air blast avoided.

5. Final pile shows good displacement. See how it has "climbed" slope.

This is the pattern of the blast. It was loaded in five rows of twenty holes each, arranged to fire in ROCKMASTER *periods shown at left.*

1 & 2—Row 1
2 & 3—Row 2
3 & 4—Row 3
4 & 5—Row 4
6—Row 5

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In the automotive field, too, Briggs & Stratton is the recognized leader — and the world's largest producer of locks, keys, and related equipment.

Volume 35
Number 2

CONSTRUCTION
METHODS AND EQUIPMENT

FEBRUARY
1953

Harold W. Richardson, Editor

Vindication in Morocco

LATEST OF THE CLAM, factual reports on the North African Air Base situation is that of Rep. Rivers, submitted to Rep. Vinson, Chairman, House Committee on Armed Services last December 1, but just reported in the Congressional Record January 13. Rep. Rivers was sent to Morocco by the Committee late in September to investigate the air bases. His report concurs with that made last fall by Rep. Riley of the Subcommittee on Public Works to the House Committee on Appropriations.

Both of these reports agree with a third investigation made last year by Glen Maxon and a group of contractors appointed by Secretary of the Army. These investigations are exactly the course of action we suggested should be taken in an editorial on this page in April, 1952.

Because of our faith in the integrity of large American contractors, and especially those firms making up Atlas Constructors—Morrison-Knudsen, Bates & Rogers, Blythe Bros., Nello L. Teer, and Ralph Mills—we always felt that an impartial, unbiased and informed investigation would acquit the Atlas group of the wild charges of wanton waste, inefficiency and gross mismanagement made before Sen. Johnson's Committee a year and more ago. These last reports justify that faith.

At last the reports piece together the history of the project, heretofore somewhat vague and confused. Late in 1950 military authorities conceived the need for air bases in North Africa, with July 1, 1951, set as a crucial deadline because of expected outbreak in hostilities. One new base was to be built, four existing French bases were to be rehabilitated.

The Atlas group was hastily formed, and told to get going. They set sail in January, 1951, with shiploads of men, machines and materials—only to be thwarted upon arrival on Mediterranean shores by Air Force delays in concluding final negotiations with the French. Only a token force of workmen was allowed to land to unload the ships and to store and guard the cargoes.

Then the Air Force decided only one old base could be used, four new ones had to be built, and more diplomatic negotiations were necessary. Right there the whole complexion of the job was changed, but there was no time to change equipment and material commitments. Some 87 possible new sites were investigated, four finally were selected, and work got under way late in April.

Then came an incredible parade of Air Force officers marching across Morocco, each over-ruling his predecessor in choice of sites, even after construction operations were well started. Yet in spite of all this confusion, two bases were flyable on July 14, only 2 weeks beyond original deadline, and 83 days after start of work.

Furthermore, while the Air Force now says it regarded the "crash program" schedule no longer necessary after Sept. 1, 1951, these views were not transmitted to the project until Jan. 15, 1952, resulting in 4½ months of unnecessary hectic construction pace.

Biggest headache of all, it is now revealed, was in bungled finances. Congress had authorized funds for the project, but only hand-to-mouth money ever reached the job. Obviously, such procedure blocked efficient planning and operations; in fact, the job was just about shut down at times for lack of funds. Rep. Riley accuses the Bureau of Budget, where much of the trouble seemed to stem, of usurping Congressional powers of appropriation.

In those early days the engineers and contractors had to take calculated risks, just as any military commander must do under stress. Near-by gravel was used as aggregate for one runway, even if equipment was not available to screen out some objectionable clay, because there was no time to make 36-mi round-trip hauls from the nearest quarry offering suitable crushed rock.

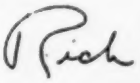
At another runway they gambled on the weather and rushed the strip into an area not properly drained because the French held up digging a long outfall ditch. (Their objections faded away upon award of the ditch to a French subcontractor.) But the rains came early, and parts of the subgrade softened up.

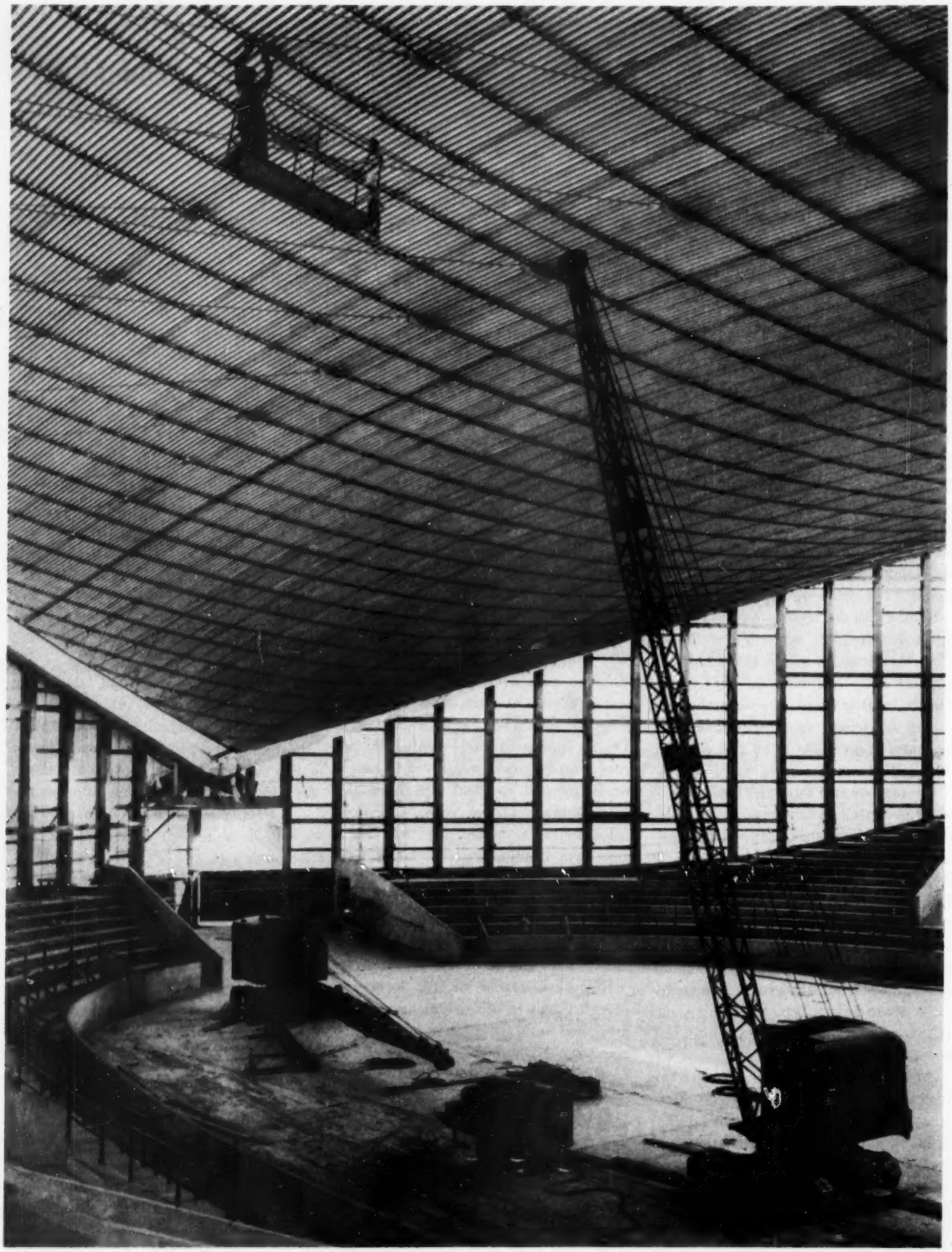
Yet, despite the rush and the exigencies of the early program, repairs to bring all defects up to standard will cost less than 2 million dollars, a trifling part of the total cost.

In the reports praise and admiration for almost impossible achievements in the face of tremendous odds replace the abuse and vilification once heaped upon the heads of the contractors, Corps of Engineers and the consulting engineers. Yet, none of them is in any way a bland whitewash of contractor and engineer activities. Probably, rightly so, there are several items of censure, but each such item is mitigated by explanation of the extenuating circumstances of building a "crash program" project on foreign soil. Of course the job never was, and never will be, perfect. When and if a perfect project is ever built in this world Gabriel will blow his horn, and St. Peter will transplant it beyond the Pearly Gates so the Hosts of Heaven can marvel at it.

We have learned much in Morocco—the need for better planning, for better international diplomacy in setting up off-shore bases, for a better understanding by all concerned as to what a "crash program" means.

But, after all, the Atlas group has been vindicated. Our faith in the integrity of American contractors has been justified.





CRANE LOAD LINE dead-ended at top of column out of sight to left forms track cable for crew car for erecting cable-supported steel roof over North Carolina State Fair Live Stock Judging Pavilion. Crane's closing line loops through snatch block on column and back to car for travel power. Line from workmen's safety belt is always kept fastened to roof cables.

High Line Crew Places Novel Roof

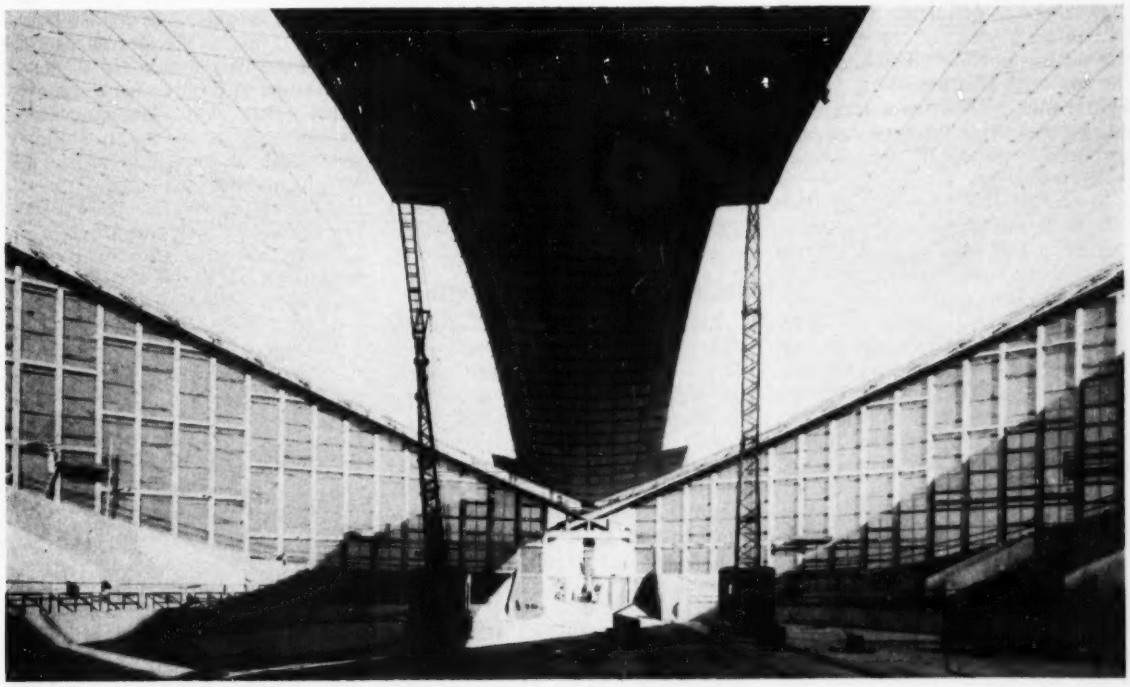
THEY WERE UP IN THE AIR, but they knew what they were doing—they were placing the world's most novel roof for the Live Stock Judging Pavilion at the State Fair Grounds at Raleigh, N. C. The roof is made up of Robertson Galbestos corrugated metal sheets clamped to a wire rope grid spanning 300 ft in both directions over a column-free arena. Placing and clipping the wire rope strands, and then setting the sheets put the workmen up in the air in crane-boom crow's nests and a cableway carrier. The bright boys of Wm. Muirhead Construction Co., general contractor for the pavilion, of Durham, N. C., dreamed up this clever erection scheme.

Not only the roof, but the whole pavilion is a weird design. It is an ellipse, 300x300 ft. Two concrete arch ribs flare outwards and upwards from X-shaped foundations at each end to form the outer rim. These ribs, supported by steel columns up to 85 ft high at center, carry the roof cable grid. The main floor is an oval 127x221 ft, with curved tiers of concrete seats rising up on each side.

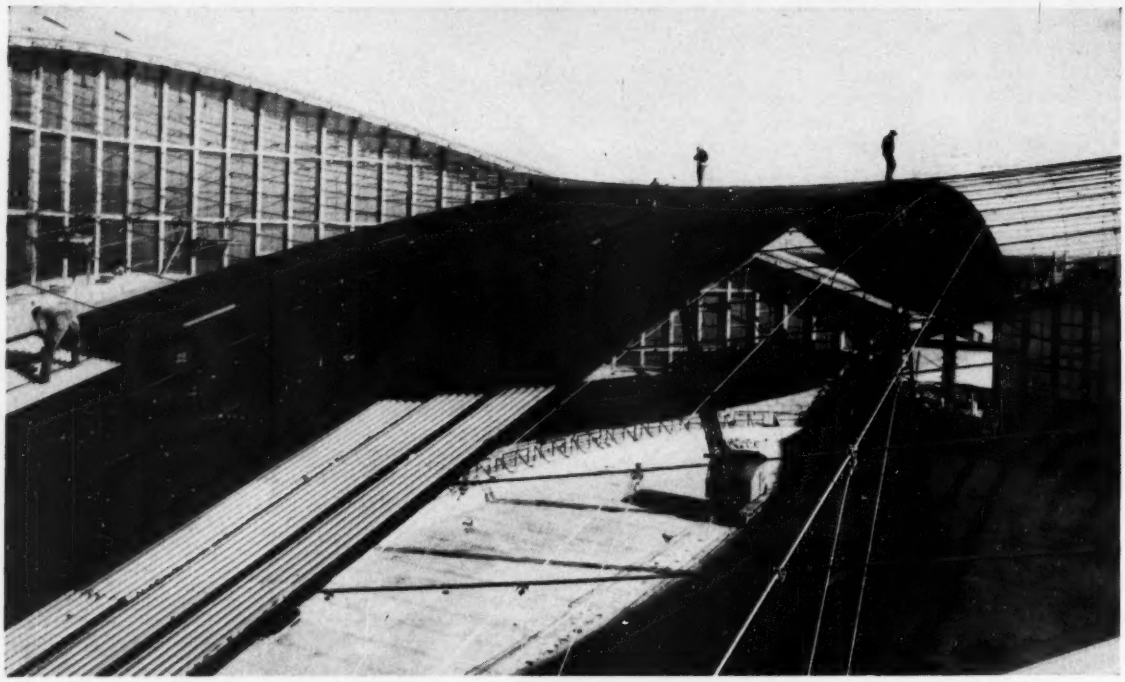
From start to finish, Muirhead had to lick many a construction problem, but how he handled the roof tops them all in interest.

WEIRD DESIGN of pavilion is best revealed by this air view. Sloping arch ribs spring out from foundations tied together below ground by prestressed cables. Wire rope grid supporting sheet steel roof is tied into arch ribs. Fireproofed steel columns carry the arches and form framework for glass walls. About one-third of roof has been placed in this view. —Aero-Pix Photo

Bethlehem Steel Co. furnished the cables, all galvanized bridge strands designed to take 100,000 psi. Main load-carrying cables, from ¾- to 1 5/16-in. dia, are placed transversely. Cross-cables are ½- to ¾-in. dia. All are clipped together in a grid of 6x6-ft spacing into a mat that resembles a huge saddle. Bethlehem figured the exact length of each cable by electric computer, and delivered



IN AREA over arena floor, cables are clipped together, and roof sheets are placed by men in crow's nests at top of crane booms. Safety belts are fastened to booms. Men on top of roof assist in placing sheets by bucking up strap clamps holding corrugated metal panels to cable grid. Sheets are topped off with fiber board insulation and built-up roofing.—Lewis P. Watson Photo



CABLES FORMING roof-supporting grid are clamped together by double clips. Exact length of every strand was figured in advance by electric computer. Length of guy wires, as shown here, could not be computed in advance, so contractor pulled free end into columns to desired tension with 100-ton jacks used for prestressing foundation cables.—Lewis P. Watson Photo

the individual strands to the job socketed at each end.

Because the seats prevented cranes from working close to the columns on the inside of the building, except at end areas, the cables had to be placed by cranes working on the outside. Reaching over the top with jibs atop long booms, two cranes picked up a strand at a time, and lifted the socketed ends to hangers at top of pairs of opposite columns.

When all the strands had been swung from supporting columns, the next job was to fasten them together at each intersection with double clips. In the area above the oval floor, workmen were hoisted aloft in crow's nest baskets at the ends of long booms on crawler cranes. From these lofty, but safe perches, made doubly safe by belt lines fastened to the booms, riggers clipped the cables together.

So far, so good, for the area was within reach of the crane booms. But how to get at the wide expanses over the rising seats where cranes couldn't reach?

Muirhead came up with this neat trick. They put a high-boom crane on the floor of the arena. Then, one line from the crane was tied into top of a column to serve as the track cable of a car that was hoisted to ride the line as a carrier. Next, the second crane line was reeved from boom tip through a snatch block at top of column and back to the carrier. As the snatch block was highest point in this system, the car could be maneuvered to any position by a combination of line pull and gravity. All the time, the track cable was kept taut. From the carrier, or traveling scaffold, workmen could clamp the overhead cables together in safety. But just to make sure these men were safe, they were hooked to the overhead cables with lines from safety belts.

Same Scheme for Roof Sheets

By the same general scheme the Robertson roof sheets were set. First sheets were placed down through the middle of the arena by workmen standing in the crane crow's nests. They drilled holes through the sheets for clip bolts for fastening roof to cables with light portable drills. As soon as a workable area of sheets had been set, operations were speeded up by placing buckers-up on top of the sheets.

The carrier system was re-installed for placing sheets over the seat areas. When all sheets had been set, insulation of 1½-in. fiber board was placed on top, then the roof was completed with conventional built-up roofing with a white finish.

That 27-gage metal roof is supposed to lie down and be good at all times—but just in case air updraft, or negative pressure tends to lift it aloft, the designers figured they had better tie it down with some guy wires from the columns. But even the marvelous electric computer couldn't figure the length of these guy wires. So Muirhead socketed and attached them at the cable end. Then a 100-ton hydraulic jack was hitched up to pull the guys into turnbuckle fastenings on the columns, thence they were pulled up to the desired tension.

William Henly Dietrick, of Raleigh, was architect for the project. The late Matthew Nowicki, of North Carolina State College, was consultant. Severud-Elstad-Krueger, of New York, were structural engineers.

For the Wm. Muirhead Construction Co., you can bet Bill Muirhead, himself, paid mighty close attention to the job. But E. F. Matteson, general superintendent, and E. A. Fulton, job superintendent, kept everything under control. Yet don't forget C. A. Frye, for, as roof erection foremen, he was the guy who really put the roof in place.

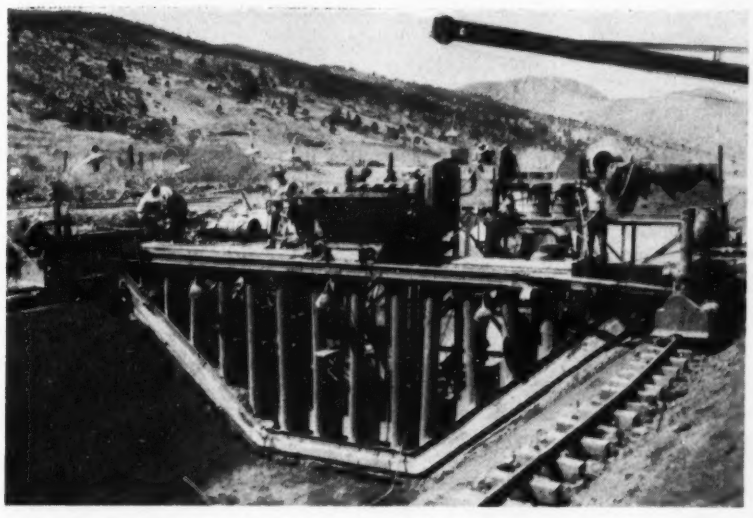
RIDING ON RAILS carefully set to exact line and grade, this traveling mechanical trimmer prepares the Horsetooth Feeder Canal for concrete on the U. S. Bureau of Reclamation's Colorado-Big Thompson project near Loveland, Colo. Buckets on an endless chain cut the canal perimeter to exact specified contour, dump their load into a revolving elevator on top deck. This elevator transfers excavated material to a conveyor flight discharging at top of one bank. Then a bulldozer spreads the dumped material. Electric power for travel, cutters and conveyors is furnished by a Caterpillar diesel generator set.

Trimmer and Concrete Liner Finish Colorado Canal

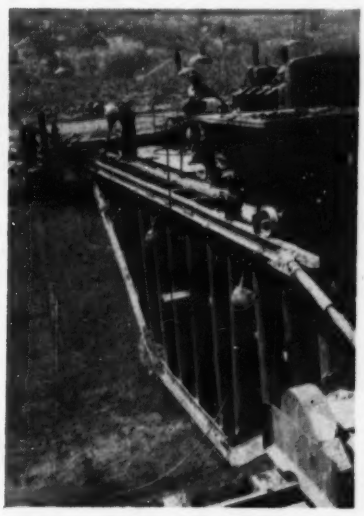
Photos from South Platte River District

U. S. Bureau of Reclamation, Denver, Colo.

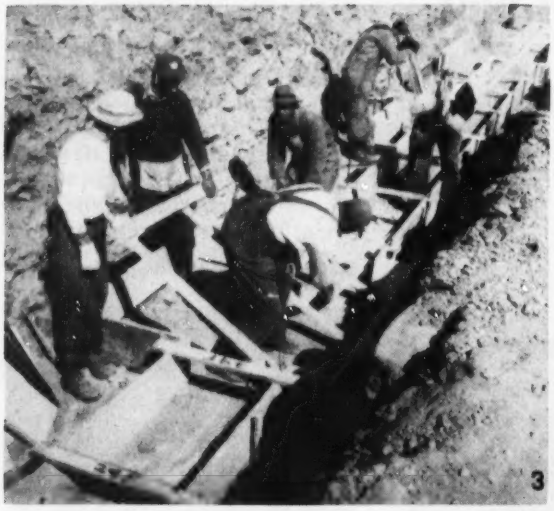
AFTER ROUGHING out the prism of Horsetooth Feeder Canal on the Flatiron section of the Colorado-Big Thompson project near Loveland, Colo., with draglines, Winston Bros. Company of Minneapolis, followed through with an ingenious traveling trimmer and a self-propelled concrete lining machine. The pictures tell the story.



INGENIOUS TRAVELING SPREADER places concrete lining in trimmed canal to correct thickness, gaged by rails on which it rolls. Concrete, mixed in paver moving along top bank, is dumped into hopper car that moves transversely to discharge into battery of spouts. Screed bar behind spouts strikes off concrete, second vibrating screed gives it final finish. Caterpillar diesel generating set furnishes power for travel and vibrators.



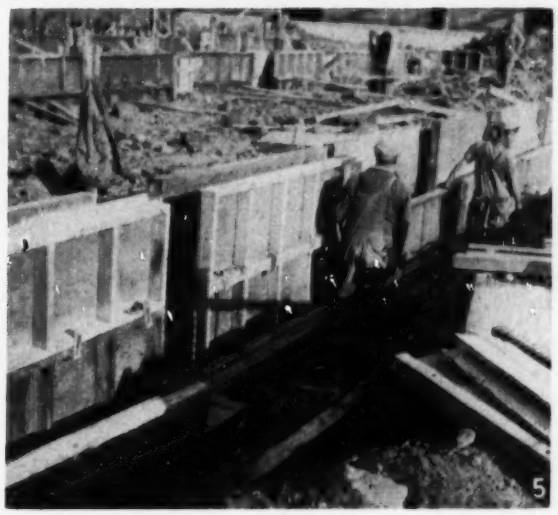
VERTICAL TUBES end at top of open trough. Trick of steady, even concreting is to keep trough full, but not overflowing. An expansion slot-cutting jumbo, and a mastic and curing compound jumbo follow.



WALL FOOTING FORMS, which are simply 2x12-in. planks, are erected at rate of 1,200 lin ft of wall per 8-hr day by crew of eight carpenters and two laborers. First, planks are distributed and pilaster templets spotted (1), then forms are held temporarily by rods (2). Spreaders across tops are pinned to subgrade to hold forms in exact position (3), and keyway form is affixed (4).

Simple Forms Make the Job Go

SIMPLE FORMWORK, well planned for easy fabrication, erection, stripping and multiple re-use, gave New York City's Merritt-Chapman & Scott Corp. a quick head start on construction of an Army Signal Corps depot at Tobyhanna, Pa. In little more than three months, before wicked weather stopped concreting for the winter, some 86% of the 45,000 lin ft of foundation walls and most of the 875 individual isolated footings were poured. Thus, work could still be continued uninterruptedly on the erection of steel frame superstructures for the 21 buildings that comprise the $16,879,000 project.

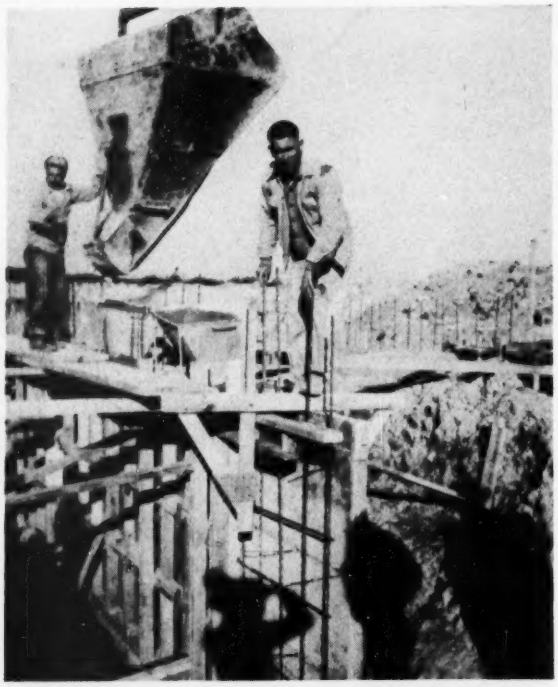


FOUNDATION WALL FORMS are 2x8-ft panels that sit on 4x4-in. starter boards nailed to inserts in footing. After Superior wire spreader-ties are placed across 4x4s (1), first lift of panels is set (2). Then next line of ties is hammered into edge of plywood panel facing (3) which extends 1/8 in. beyond frame. Upper panels are set (4) and all ties wedge-clamped (5) to hold form.

Located on a wind-swept mountain top in the Poconos of northeastern Pennsylvania, the Tobyhanna General Depot sprawls over a 368-acre site. And MC&S's 21 buildings, which total 2,200,000 sq ft, range in size from 625 sq ft to 17 acres. That's quite a variation.

Exclusive of slabs on the ground, 26,700 cu yd of concrete was required. Some 18,000 yd of this was in foundations whose forms ran an average 50 sq ft per yd, which meant that nearly a million ft had to be formed up for substructure alone. But simple formwork and efficient organization made it possible to place better than 20,000 sq ft of forms and pour up to 400 cu yd of concrete in a day.

• **Form innovations**—Simplicity was the keynote on form design. Wall footing pours, for example, were merely confined by 2x12-in. planks. Foundation wall forms were 2x8-ft panels held by through-wall ties just at the edges so no holes had to be drilled in the units. Isolated piers forms were a pinned, four panel assembly that could be handled as one piece and used without clamps. And forms for the only three-story concrete-frame building on the job (most of the rest are single-story steel-frame structures) could be



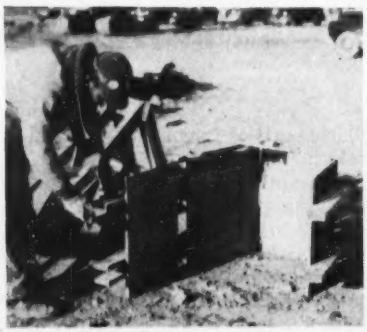
FOUNDATION WALLS are poured by crane-handled Insley bucket with concrete mixed in transit from job batch plant. Metal funnels prevent spillage. Forms are braced by double 2x4 strongbacks on 8-ft centers, shored to sides of trench. For higher wall pours (right photo) bucket top has been built up to increase capacity, and walkway planks are carried on scaffold yokes on top of forms.

rapidly assembled without nailing.

• **Foundation excavation** — The nearly 9 mi of foundation walls were built in trenches up to 14 ft deep excavated by backhoes. Because of the speed with which the footings could be formed up (1,200 lin ft per gang in 8 hr) it was essential that the hoe have clear sailing. So, to provide this in the mixed ground encountered (large boulders, ledge and earth) the machine was preceded by two wagon drills. These put down exploratory holes that were loaded and fired whenever hard material was met.

• **Wall footings**—After trench bottom was dressed and batter boards and string lines set, prefabricated templets for pilaster footings were positioned. Forms of 2x12-in. planks were placed around them, then similar planks were set to form the 12-in. high by 18-in. wide footings for walls running between pilasters. Footing-form planks were spaced and held upright by 1x4-in. spreader boards spiked across the top with double-headed scaffold nails. Lengths of scrap reinforcing rod passing through holes in the projecting ends of the spreaders pinned the forms in position on the subgrade. Lastly, a longitudinal keyway form was nailed to the underside of the spreaders.

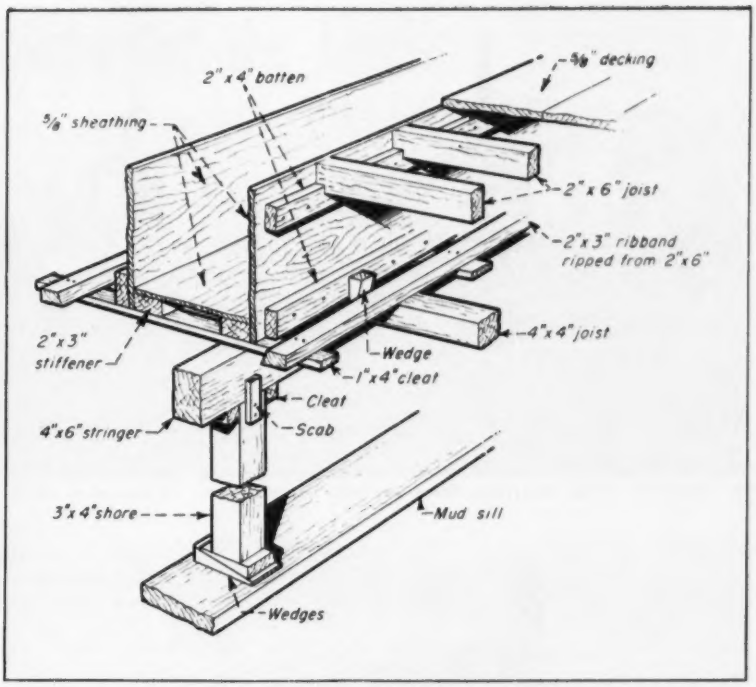
• **Foundation Walls** — After wall footings had been poured and stripped (by simply removing the spreaders' scaffold nails and rods) foundation wall forms were erected. These were in 2x8-ft horizontal panels of $\frac{5}{8}$-in. plywood on a frame of 2x4s. The plywood facing extended $\frac{1}{8}$ in. beyond top and bottom 2x4-in. plates so there was space for wire spreader-ties to be placed between frames of superimposed panels. Thus, when ties were wedged, the horizontal mem-



PIER FORM is one-piece assembly hinged by bolts through ends of horizontal studs, which act as clamps. It is easy to place, and can be stripped simply by pulling two pins and opening it up.

ALL FORMS are moved around site by Deere farm trailer drawn by Case wheeled tractor. With average of 10 re-uses per form, and with 21 buildings (one of which is 17 acres), moving is big job.

PILASTER FORM is simple too. Side panels are plywood stiffened by single 1x4 and held in place by lipped edges of the back panel.



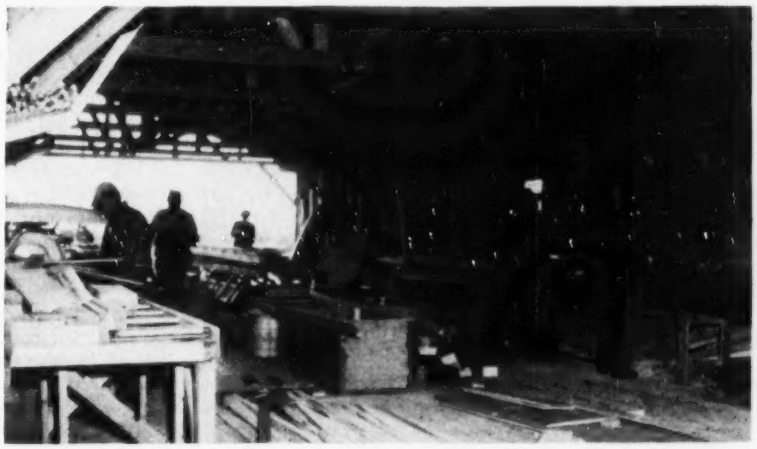
BEAM AND SLAB FORMS go together without erection nailing. Girder form has similar bottom for wedging of side panel, but latter carries vertical 2x4 studs instead of horizontal battens. And T-jacks, instead of shores and framing, support the girder forms.

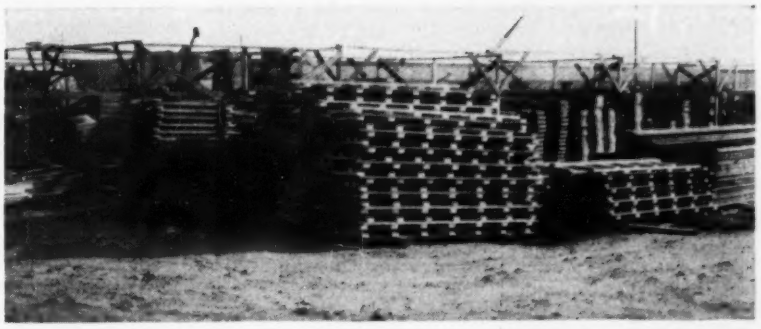
bers of the frames acted as walers, and no additional ones were required. Nor was it necessary to drill any tie holes in the panel—the wire was just embedded in the plywood edges with one blow of a hammer.

Foundation walls are 8, 9, 10 and 12 in. thick and are generally 4 to 7 ft high. First step in forming was to place plywood-faced 4x4-in. starter boards, which were toenailed to scrap lumber inserts embedded in the top of the footing pour. Across these were rested through-wall wire ties of the proper length. A row of the 2x8-ft form panels was placed next and fastened to the 4x4 below with a doubleheaded nail near each end of the bottom plates. After another row of wall ties was placed, a second row of form panels was set on the first.

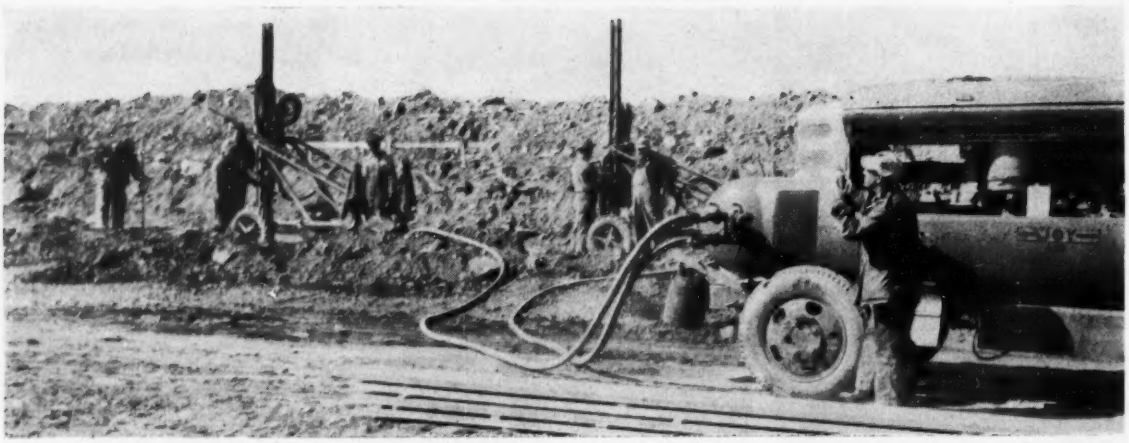
This procedure was continued for the height of the wall, abutting panels being clamped together by short form ties through holes in adjacent plates and end studs. Yokes of 16-gage strap steel 1 in. wide, whose down-standing legs were welded to the transverse piece for added strength, kept the tops of the forms from spreading.

Erection sequence was pretty much standard. The interior wall was formed first, aligned and





JOB FORM SHOP (top photo) prefabricates all units for extensive project. Fitted with three DeWalt saws, it made some 50,000 sq ft of panel forms for foundation walls alone, which total nearly 9 mi. Completed units are marked and stored outside awaiting use.



WAGON DRILLS of Philadelphia's Globe Contracting Co. prepare for foundation trench excavation. These Joy units explore mixed ground, which is blasted when hard material is encountered. Globe is excavating sub for Merritt-Chapman & Scott Corp., New York.

BACKHOE, a 1¾-yd Lorain, follows wagon drills to dig trench. Fast excavation to keep ahead of formwork would have been impossible without advance blasting of boulders and ledge rock.

braced by double vertical 2x4 strongbacks placed at the panel joints and shored to the side of the trench. After reinforcing steel was tied, the wall was closed. This was a simple job because the 2x8-ft panels could be handled easily by one man, and they did not have to be threaded over any ties. Panels were re-used an average of 10 times before rebuilding was necessary.

• **Building frame**—The three-story administration building has a beam and girder floor system. Bottom and sides of the form boxes for these members were designed to be wedged together—no erection nailing.

Bottom forms were ⅝-in. plywood sheathing stiffened by a continuous 2x3 fastened beneath each long edge. Nailed under the 2x3s were 1x4-in. transverse cleats, which extended far enough out on each side to carry a continuous longitudinal 2x3-in. ribband nailed to their tops. Between the stiffened edge of the bottom sheathing and the inner beveled face of the ribband there was a space for a side form panel to be rested on the cleats and held tightly by wood wedges.

Girder side forms were sheets of ⅝-in. plywood backed with vertical battens on 16-in. centers, to which one continuous horizontal stiffener was nailed. Both stiffener and battens were 2x4s on the flat. The ⅝-in. plywood sheathing of the beam side forms, however, carried just two continuous horizontal 2x4 battens. The lower 2x4 coincided with the bottom edge of the sheathing, the upper batten was set down far enough to act as a ledger for notched 2x6-in. joists that supported ⅝-in. plywood decking for the floor slab.

Girder forms were supported by T-jacks of 4x4s. Beam forms rested on a framework of transverse 4x4s atop longitudinal 4x6-in. stringers, which were supported by 3x4 shores. To hold the members in place, yet make removal easy, cleats on the underside of the stringers fitted over the tops of the shores, whose opposite sides were fitted with scabs extending up 1½ and 3 in. Both T-jacks and shores were wedged at the bottom to mud sills.

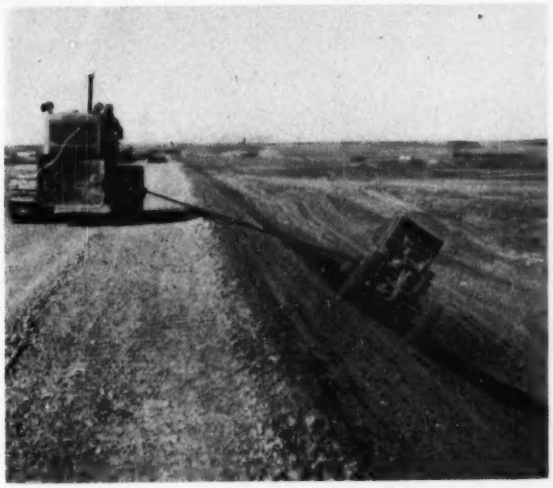
• **Form manufacture**—All forms, both for foundations and superstructure, were prefabricated in MC&S's job carpenter shop. To cut down the time required for complete familiarization with all forms, the 15-man shop crew was divided into specialty gangs that each worked only one type of form at a time. One group might make up beam bottoms only, for example, then switch to side panels when these were all done. (Similar procedure in the field kept form erection at a fast pace, too. Some gangs handled nothing but footing forms, while others specialized in wall panels.)

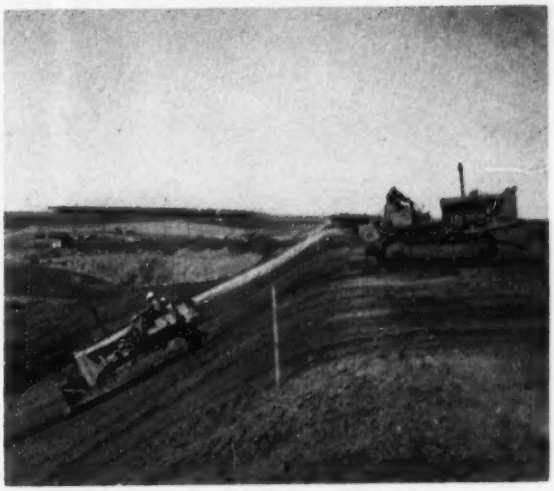
Another timesaver in the shop was putting marks and stop-blocks on the bench tops to act as templets. It was a simple matter for even a green carpenter to follow these and turn out a perfect form.

• **Project personnel**—Construction of the Tobyhanna depot is under the direction of Col. Walter Krueger, Jr., district engineer of the Philadelphia District, Corps of Engineers, for whom Lt. Col. Charles S. Tucker is resident engineer. The Philadelphia firm of Gilboy & O'Malley is architect-engineer on the project. For Merritt-Chapman & Scott Corp., New York, George A. Deane is project manager, Ed M. Card is engineer, and George Ogilvie is general superintendent.

Thanks for the Lift!

SAFELY SNUBBED by a winch line from an Allis-Chalmers HD20 tractor a 15-yd Euclid end-dump loaded with gravel riprap nonchalantly backs down the steep downstream slope of Garrison Dam on the Missouri River in North Dakota. Ben Williams, project manager for PK-MK (Peter Kiewit Sons Co. and Morrison-Knudsen Co., Inc.) on the 24-million yd Stage IV of the big embankment, takes no chances with his equipment; hence the snubbing line. Garrison District, U. S. Corps of Engineers, is building the project.





SAME IDEA, but different application, shows up a few miles above Garrison Dam where Lytle & Green are building a saddle embankment known as Snake Creek Dam. At left a Caterpillar 12 grader trims the slope with a longitudinal run as a winch line from a Cat D8 tractor holds it on course. On the other side of the fill, where the slope is steeper, a couple of Caterpillar D8's pair up as a safety team. The top rig with a Hyster winch snubs the bulldozer up and down the slopes for transverse trimming. Result is a smooth job on a steep slope.

Spliced lengths tower into Oregon skies as...

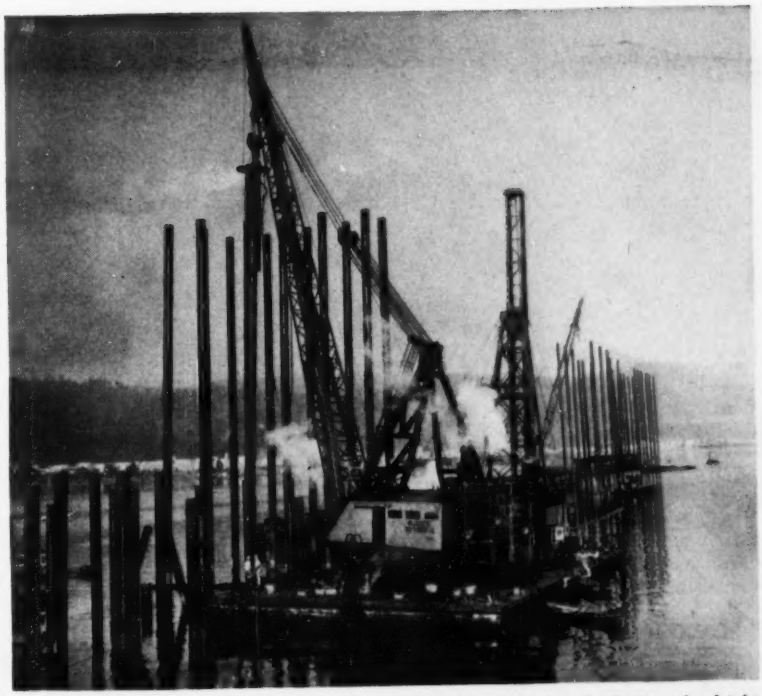
Big Rigs Drive 220-Ft Pipe Piles

By HAL HUNT
Resident Engineer, Frederic R. Harris, Inc.

BIG AND GOOD EQUIPMENT is being used by the Guy F. Atkinson Co. to build a finger pier on 24- and 18-in. pipe piles up to 220 ft long to serve floating drydocks for the Port of Portland Commission at Portland, Ore. The pier stands 82 ft above stream bed on the Willamette River at the foot of Swan Island, and is designed by Frederic R. Harris, Inc., to be somewhat flexible.

Like the structure, the contractor has a flexible organization and plan of action that permits change, if details or ideas do not work, or if extra time on some item puts other activities out of schedule.

First problems were to drive long pipe piles in 50 to 70 ft of water and to install a shore bulkhead of 105-ft sheet piling in circular cells 69 ft dia. Other challenging construction includes driving battered H-pile bracing and then forming and placing concrete in pile caps and a heavily reinforced deck 82 ft above the river bed. The river is dredged to 50 ft below low water for operation of floating drydocks; water fluctuates 30 ft from high to low and 2 ft of freeboard are required, accounting for height of the structure.



SWINGING LEADS on barge-mounted A-frame drive first 140-ft length of pipe piles (right center), while free-hanging hammer in special cradle (left) socks home spliced lengths up to 220 ft long for Portland pier.

Piles Carry 200-Ton Loads

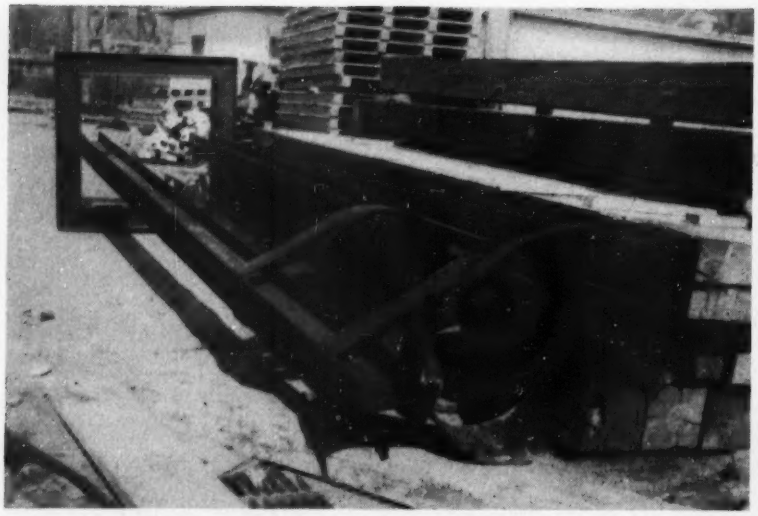
For a length of 580 ft, where a drydock will be moored on each side, the pier is 50 ft wide and is designed to carry loads up to 200 tons for a single pile. To support this load, 24-in. dia, ⅜-in. wall pipe piles are driven open-end and filled with concrete above the level of compacted material inside the pile.

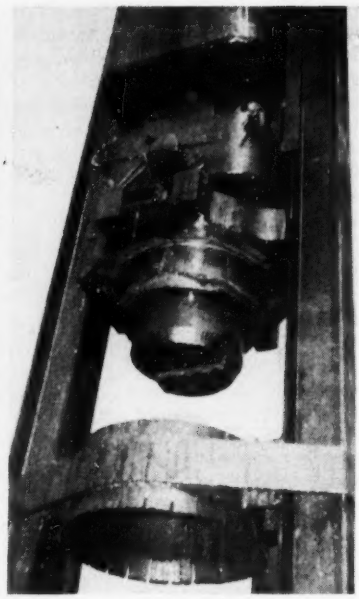
The pipe piles have a considerable resistance to bending, but to resist excessive lateral loads from wind and ships, 14-in., 89-lb H-piles are driven on a 1 to 2 or 2¼ batter. These H-piles bow a little as the pipe bends so the entire structure works together, springing and then returning to position after a blow.

Beyond the length where the drydocks operate, the pier extends an additional 507 ft as an approach guide and tie-up position for ships coming into or leaving the drydock. This area is dredged only to 30 ft below low water. The lighter structure is carried on 18-in. dia, ⅜-in. wall pipe, again with batter H-piles as bracing.

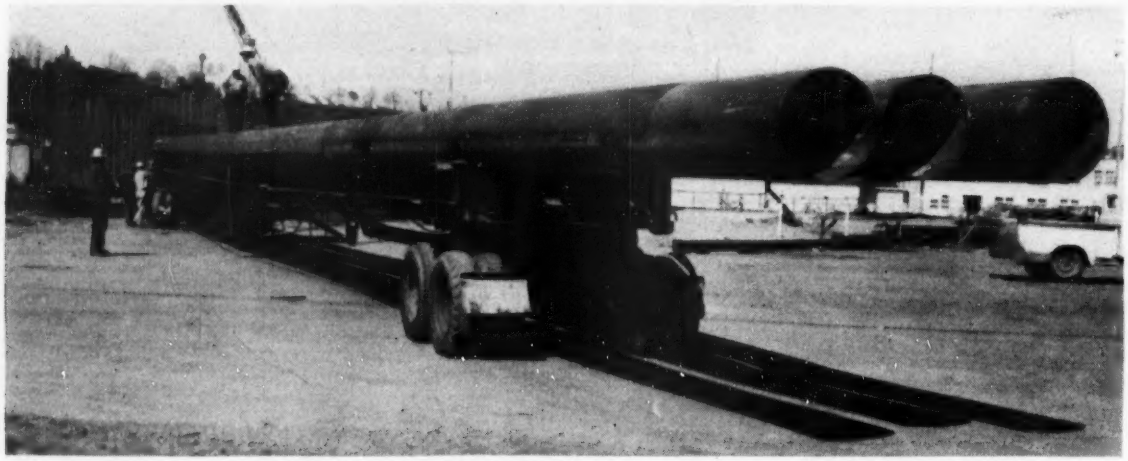
Rather than trying to make their own available equipment do, Atkinson obtains, frequently by rental, the most suitable machines in the area to handle the work. This

AT FIRST, both vertical pipe piles and batter H-beam bracing were driven with this swinging lead rig, but later templet was clamped to pipe bents to guide batter piles so they can be driven by free hammer held in clever cable sling, as shown in other pictures.





AS LOWER 140-FT LENGTHS of pipe piles were driven to at least 50-ft penetration with hammer in leads, spliced lengths up to 220 ft long were driven to final position with free hammer riding in this special frame.



LOWER SECTIONS of pipe piles were welded into 140-ft lengths on shore and hauled to barge side by this 100-ft trailer made up of hog-rodded, 100-ft H-beams.

procedure brings in the most efficient equipment. When a machine can not be used advantageously, it is released, sometimes to other near-by jobs. Personnel is handled somewhat the same way. Atkinson has a number of jobs not too far away, and specialists frequently are brought in while a part of the work is expedited.

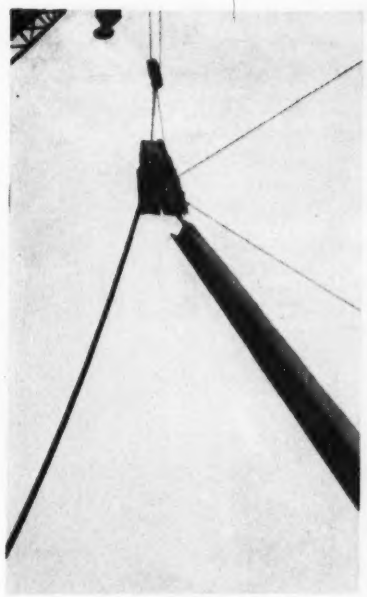
Floating equipment is, of course, a most important item. Two big, barge-mounted American revolving cranes are rented from Willamette Tug and Barge; sometimes an additional Washington crane on a rebuilt LSM hull is used. Another floating crane handles some dredging and fill. Each of these rigs has two 2- or 3-drum hoists on the deck to handle anchor lines.

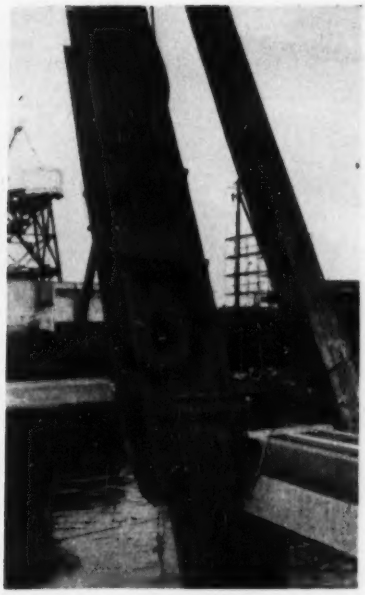
Largest of the rigs, 75-ton capacity, is mounted on a 116x52x10-ft steel hull. To drive the long 24- and 18-in. pipe piles, special movable leads 97 ft long were mounted at one end of the barge where they could be serviced by the American Revolver. The leads rotate from the top of a 57-ft A-frame, while a moonbeam at the bottom takes care of side movement by manila lines to the winch head of a two-drum hoist that also handles hammer and pile lines separate from those on the crane.

Pipe for piles comes mostly in 80-ft lengths, with additional 40-ft lengths, as required. The contractor assembles the pipe into 120-ft lengths on shore (during spring high water some pieces were made up 140 ft long). These lengths could be set into 100-ft leads as 50 to 70 ft of water was available. For handling the pipe on shore, a job-made trailer with a bed of two 100-ft long steel beams was used, hog-rodded to give center support. Piling was welded, cleaned, and coated where required in a job yard.

The 140-ft lengths of pipe were stiff enough to handle with a two-point pickup. Pipe was transferred to barges at the river edge and set into the leads by the revolving crane on the driver barge.

Test piles were required to be driven in advance, with tests specified up to 450 tons on the 24-in. piles and 300 tons on the 18-in. Hoped-for resistance to driving





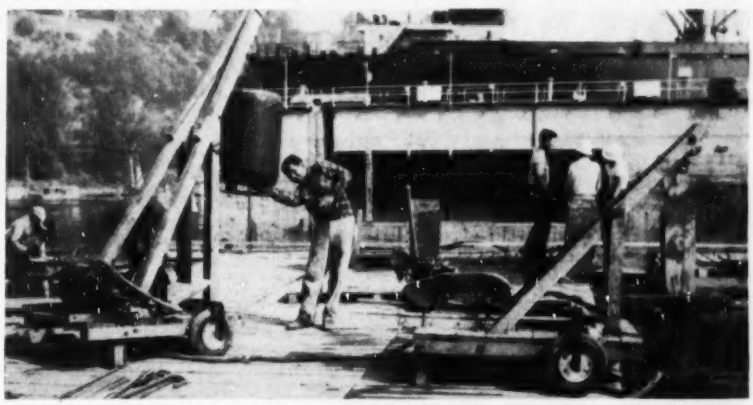
FREE HAMMER in guide frame is held by cable sling for driving H-beam batter piles that are guided by templet fastened to pipe piles.

was not attained until the piles reached a very hard strata 150 to 180 ft below low water. Cut-off is at plus 24 so that some of the piles are in excess of 200 ft long.

Piles are driven open-end to aid spotting in exact plan position in the five-pile bents. This works quite well, and only one pile has ended up more than 1 ft out of theoretical location; the average is less than 4 in., despite the long pile length and driving in 70 ft of water. Piles are lined up with two transits on shore. Where it is not possible to operate from a right angle, triangulation or measuring is used.

A number of 120- to 140-ft bottom sections of pipe are driven until their tops are just above water. A floating crane then sets additional 80-ft lengths and holds them for tack welding. Later full penetration welds are completed at the convenience of the operators. It is not practical to come back in over the piling with the driver leads. As the piling is quite stiff, it is possible to use a short swinging lead set on top of the pile itself as a guide for the hammer.

Piles are driven with an 80C Vulcan differential-acting hammer, sometimes supplemented with a single-acting OR Vulcan. The 80C develops 20,900 ft-lb at 105 blows per min and the OR 30,000 ft-lb at 50 blows per min. However, it requires just as many blows per ft and twice the time to drive with the OR compared to the 80C, so the differential-acting hammer is used except in case of breakdown.



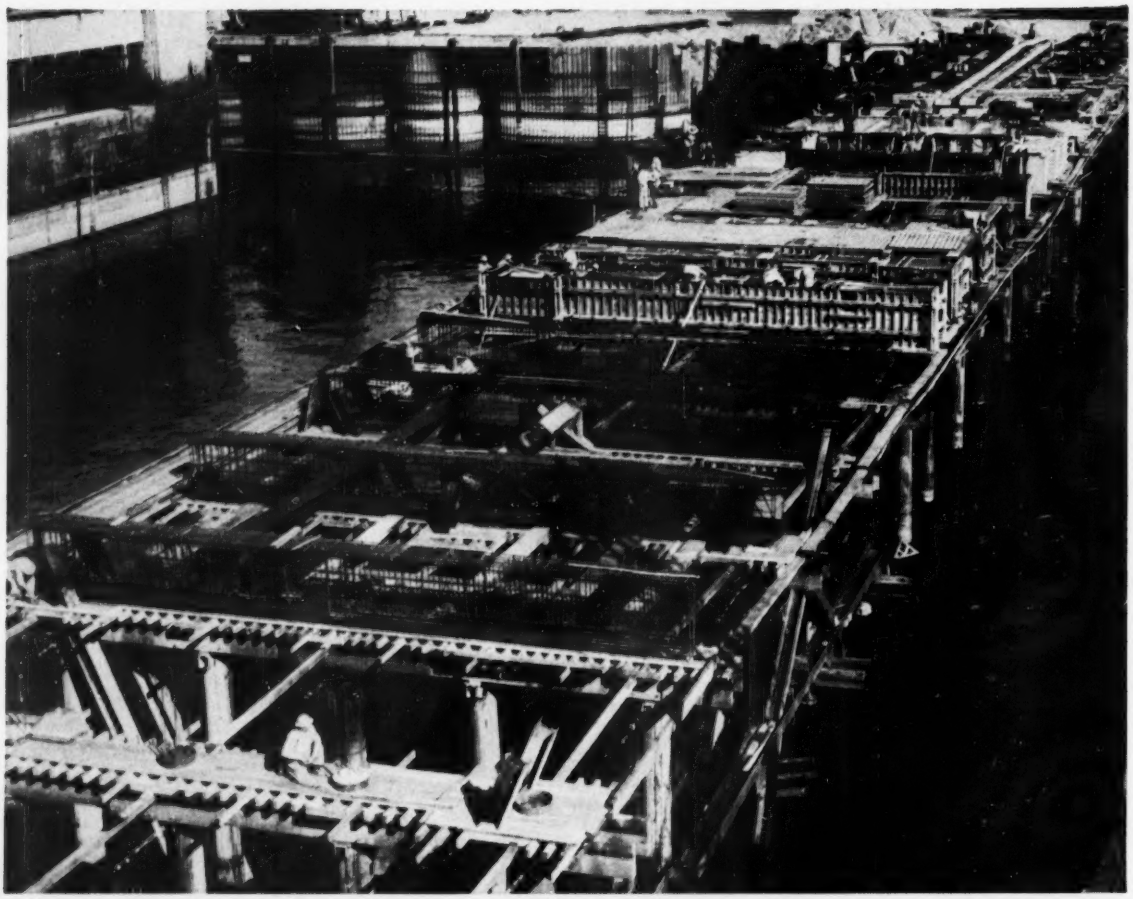
JOB-ASSEMBLED RIGS removed water from pipe piles prior to filling with concrete. At left is bailer operated by Ingersoll-Rand air hoist. Rig at right is Wisconsin gas-engine hoist handling I-R air pump lowered into pipe.

After the 80-ft section is added, driving generally meets more resistance. For most of the distance, 40 to 60 blows per ft are required until compact gravel is reached 115 ft below the ground, 165 ft below low water and 190 ft from pile cut-off. Driving requires some 30 min of hard hitting per pile. Several types of cushion blocks have been tried, but all require frequent replacement. Most successful is $\frac{5}{8}$-in. wire rope in a tight, flat coil, spot-welded to keep it from unwrapping.

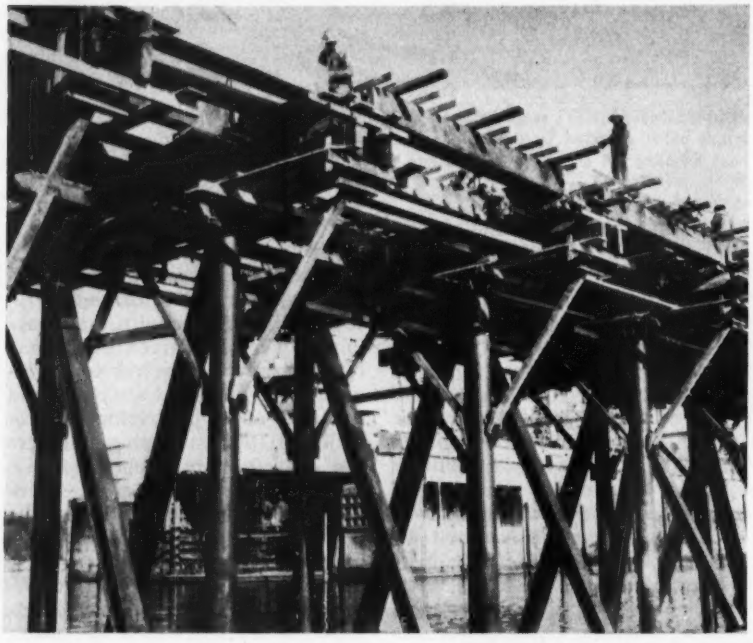
The contractor developed a special driving head $\frac{1}{8}$ in. smaller than the inside pipe diameter. In addition, the driving head was grooved to hold the 14-in., 89-lb H-piles driven on a batter.

It was planned to drive the H-section batter piles with the rotating leads on the driver, but it was found that this requires considerable maneuvering of the barge and a special order of driving. To expedite H-piling driving, timbers are placed across the pipe pile bents as a templet. An 11B3 McKiernan-Terry hammer in a cable sling set does the driving. Longest H-piles are 128 ft. Two lengths are welded on shore into this length, handled with a two-point pick-up.

Exposed piling above low water is thoroughly cleaned by wire-brushing or sand-blasting, and



PILE CAP SOFFITS in foreground, reinforcing steel for cap, caps formed ready for concrete and, in background, deck forming under way shows sequence of concreting main deck section. Power-buggy runway is at left side. Steel at lower right is drydock guide.



CAP AND DECK FORMS are framed together for narrower outer section of pier. Note welded brackets on pipe piles for supporting form bracing struts and crossbeams.

doped with two coats of Koppers Bitumastic 50 to protect the steel from rusting. Coating is damaged by wire rope abrasion or sharp metal corners, but resists most other rubbing and can be patched.

The open-end pipe piles are not cleaned out to the bottom. Piles are dewatered by pumps and bailers, a few feet of gravel is put in the pile so concrete is not dumped into water; the pile was filled to the top by dumping.

Pile cap and deck forming are carried on steel brackets welded to the pipe piles. These support a pair of 6x18-in. timbers that, in turn, carry cap soffits and beams spanning 21 ft between bents to carry the deck beams. The timbers are bolted across the piles to stiffen the bent prior to placing the pile and cap concrete.

Concrete is placed with Gar-Bro power buggies. For filling the piles and concreting the caps the carts operate on a runway at the end of the timber form supports. Con-

(Continued on page 68)

Macwhyte 6x25F PREformed Monarch Whyte Strand Wire Rope with I. W. R. C.

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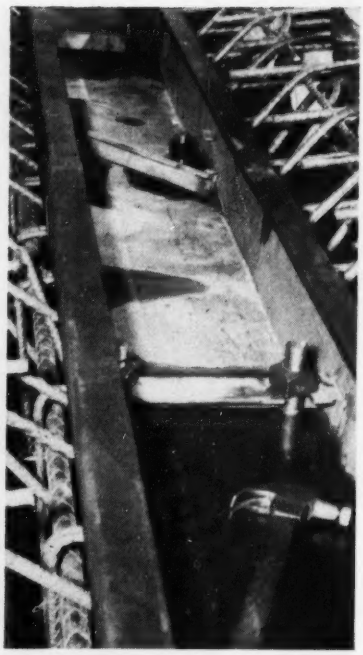
DECK CONCRETE is hauled out from shore by Gar-Bro power buggies running over removable runways.



STEEL PAN devised by contractor forms recess for track rails on deck and serves as templet for rail bolts. Wedge cross-angle holding bolts in place is stripped with tap of hammer.

crete is dumped into the piles, and for cap pours the carts run up a short ramp to discharge directly into the form. For the decks, successive 140-ft sections between expansion joints are placed from a runway laid over the form and reinforcing steel.

The shore bulkhead is a series of circular cells used as a transition from land at El +32 to river bed dredged to El −50. There are six 68.4-ft dia cells connected by circular sheet-pile arcs. Each cell requires 172 flat-web sheet piles 15 in. wide, MP-101 section with a ⅜-in. web. Connecting arcs require 27 pieces of the same section with standard Tees driven in the cell.

Sheet piles along the water side extend from El +31 to −73, a length of 104 ft. On the land side it is possible to bring the tops of the sheet piles to only +19, thus requiring 92-ft piles. Piling was purchased by the Port of Portland prior to award of the construction contract; in fact, prior to completion of design.

Sheets were ordered in alternate 50- and 55-ft lengths for a bottom ring of piling to stagger splices 5 ft. On the water side, additional 55- and 50-ft lengths are needed. Landside piles require only 45- and 40-ft additions to make up 95 ft. This allows a little for cutting, if sheets are damaged in driving.

Area Dredged First

Prior to start of cell construction, the general area was dredged to El −20. All sheets are driven to EL −73, thus requiring more than 50 ft of driving. At first, a double-ring templet was made up of a 10-in., 20-lb channel curved into a circle 7 in. smaller dia than the center line of the theoretical cell. This was cross-braced with timber and structural framing and stiffened for handling by use of H-beams.

An outside ring only, also of 10-in. channel, was held 10 ft below the main frame by vertical and diagonal angle bracing. After driving one cell it was found desirable to have a higher bracing ring to support the top splice section. A timber frame 15 ft high was made so it is easily removable to permit passage of the hammer as the sheet piling is driven.

Sheets for the lower 50- to 55-ft length can be handled easily. Design required that the sheet-pile splices in landward quadrant be welded for uplift and overturning resistance. The contractor tried welding into 95-ft lengths in advance of setting. But, the piling was too limber to handle and too long to thread into adjacent sheets without special rigging, so only single-length sheets are now set and closed in for the bottom ring.

It was found that the sheets creep in setting, so the templet was lagged to larger than theoretical size. A 5-B McKiernan-Terry hammer drives the individual sheets to an even bottom line and a 5-ft staggering of joints in alternate sheets.

The top ring of sheet piling is then set. Plan was to drive to not more than 5 ft differential of sheets. This probably should be reduced to 3 ft or the differential length of sheets increased to prevent driving the joints beyond the joint in an adjacent sheet with consequent possibility of driving out of interlock. Top and bottom lengths of

(Continued on page 70)

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The Model 450 Remington Stud Driver sets up to 5 fastening studs per minute—a speed unmatched by other powder-actuated tools. Completely self-powered, this amazing tool fastens steel or wood structural pieces to concrete or steel surfaces in seconds. Its light weight—only 5½ pounds—makes it ideal for use overhead or in confined spaces. Check these other *exclusive* Remington Stud Driver features:

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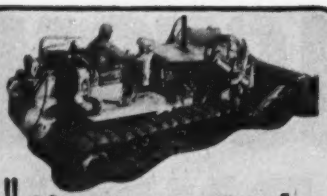

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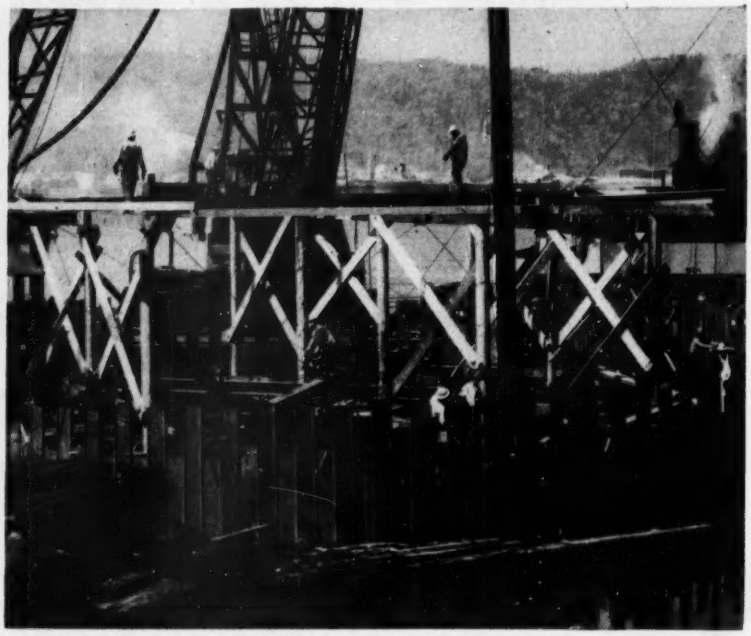
PIVOTING 220 FT. PIPE PILES . . . Continued from page 68



TEMPLET 25 ft high inside of 68½-ft dia bulkhead cells support sheet piles up to 105 ft long. Lower sheets already driven here are alternately 50 and 55 ft long. First of top ring of sheeting is just being set. Splices are welded on landward quadrant to resist uplift.

TWO BULLDOZERS spread and compact dumped fill inside of bulkhead circular cells.

piling could be connected to accomplish the same objective, which was done on the landward quadrant only. Minor difficulties only developed on this work, but there is a dangerous potential.

Driving is hard and slow from the time the upper length of sheet piling is installed. Most of the driving is by a 9B3 McKiernan-Terry double-acting hammer operated at a speed to give 8,000 ft-lb of energy. An 11B3 hammer (about 18,000 ft-lb) was tried but did not do as well. At times, the McKiernan-Terry No. 5 (1,000 ft-lb) did as much, but only at the start of driving.

Piling is set accurately and driven straight. Still, two rigs operating separate hammers drive as dumped into the cells. As soon as little as 2 ft on the 172 piles in an 8-hr shift. No satisfactory explanation is known; near-by open-end pipe piles drove quite easily at the same depth. Sand friction in the interlocks might be a factor.

After adjacent cells are driven,

(Continued on page 72)

New Caterpillar 8SR takes 'dozer-busting rocks in stride

Caterpillar D8 Tractor with 8SR Bulldozer gets out heavy rocks on highway construction job near Hapeville, Ga. Owner is Hugh Steele Construction Co. of Atlanta.

If rocks or other hard-to-handle materials cause high maintenance costs on your regular 'dozers, the Caterpillar 8SR Bulldozer will pay for itself. On really tough construction jobs, the strength of this new, heavy-duty Cat 'Dozer comes into its own. The 8SR can dig in and break loose large rocks, broken concrete shale, and hard clay overburden where other bulldozers fail.

Cutting edge, moldboard and blade ends are heavily reinforced, high-strength steel to resist bending and abrasion. Push arms are extra-heavy. Adjustable braces vary blade pitch for best handling of different materials. Six-line cable, on a choice of front- or rear-mounted control, runs through hardened triple-sheave block for easier blade handling.

The 8SR Bulldozer is designed to team up with the Caterpillar D8 Tractor on your roughest jobs. The ruggedness and precision of Caterpillar manufacture give long work life and low down-time. A valuable "plus" is fast, on-the-job service from your well-stocked Caterpillar Dealer. He'll be glad to tell you more about this tough new Caterpillar 'Dozer. Give him a call today.

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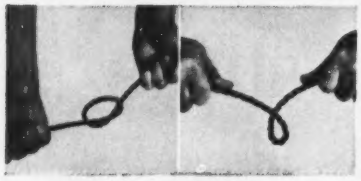

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220-FT PIPE PILES . . .

Continued from page 70

a connecting arc between them is set on the river side. There is a tendency for them to pull outward from plan location, also pulling the cell segments near the tees. Filling the cells prior to installing the arc walls might be helpful in maintaining alignment, but has not been tried.

Cells are filled with sand, or sand and gravel. Some material is placed by clamming with a barge-mounted crane; most is trucked in and dumped into cells. As soon as the fill in the cell reaches water level, a bulldozer is hoisted into the cell to spread and compact the material. Water is added to give about 12% moisture; compaction is above 95%. A small vibrator is used to compact the surface, and for hard-to-reach places, including backfill under pipelines.

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A three-piece steel floating drydock is to be moved from a near-by pier to heavily built spuds attached to the pier so the drydock can be operated under any condition of water or wind. A five-piece timber dock will be brought to the other side of the pier to complete a ship repair facility modernization and consolidated activity of the Port of Portland, costing a total of more than $3,000,000. The new facilities will be available on a rental basis to marine repair contractors.

The Port of Portland Commission is headed by W. L. Williams; John J. Winn, Jr., is general manager. Design of the structure was done by Frederic R. Harris, Inc., for whom Hal Hunt is resident engineer, assisted in the field by William Olson, Milton Habush, and Floyd Martin.

Guy F. Atkinson Co. has the major construction contract at about $2,000,000. Field work is directed by Leland Cox; Joseph B. McNabb was project engineer through the major construction period with Robert Harris, office engineer and William Henager, field engineer. The work is administered from Atkinson's Portland District Office, William Chance, District Engineer and Harry Hunt, manager.

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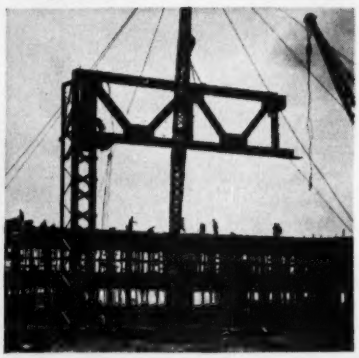

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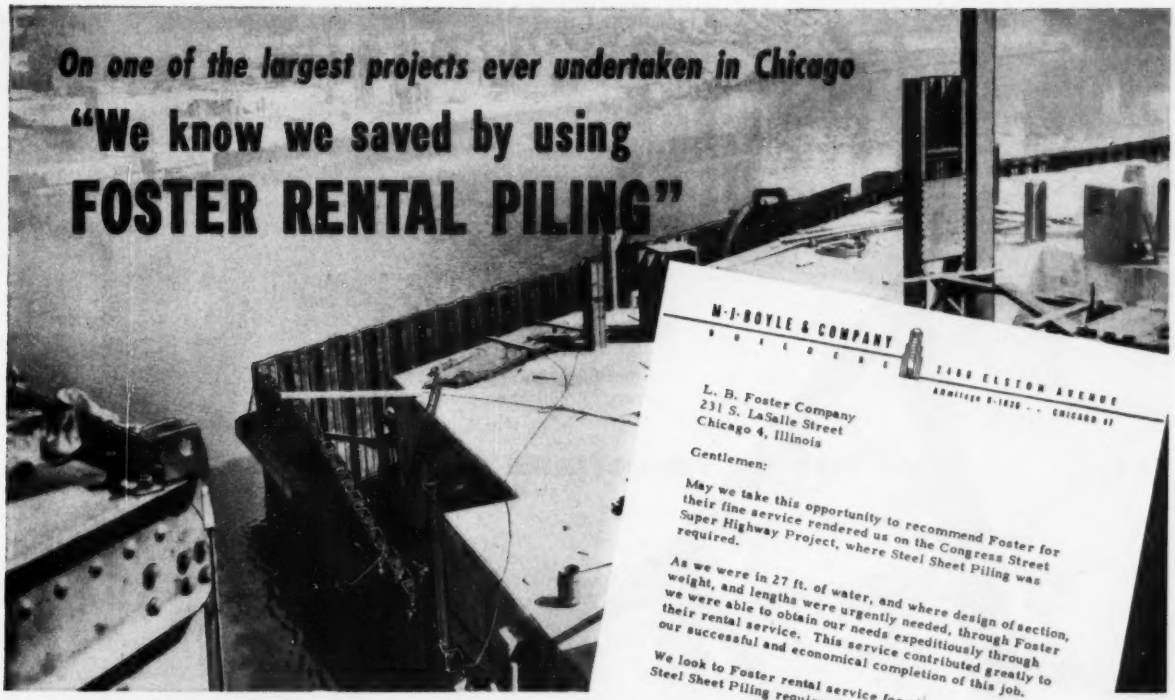

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Chicago River Bridge Pier

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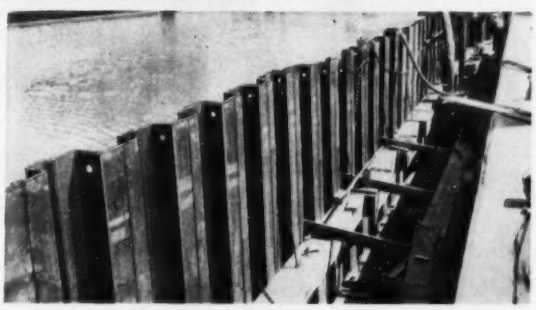

TOP: Foster Steel Sheet Piling used in the construction of the reinforced concrete bridge pier located on the west bank of the Chicago River.

RIGHT: Accurate driving was made possible with top quality steel-sheet piling (in the proper lengths and sections) —an exacting job kept seepage to a minimum.

• Your nearest Foster office has this informative bulletin illustrating the uses and advantages of renting steel sheet piling . . . write or phone for Bulletin CM-2.

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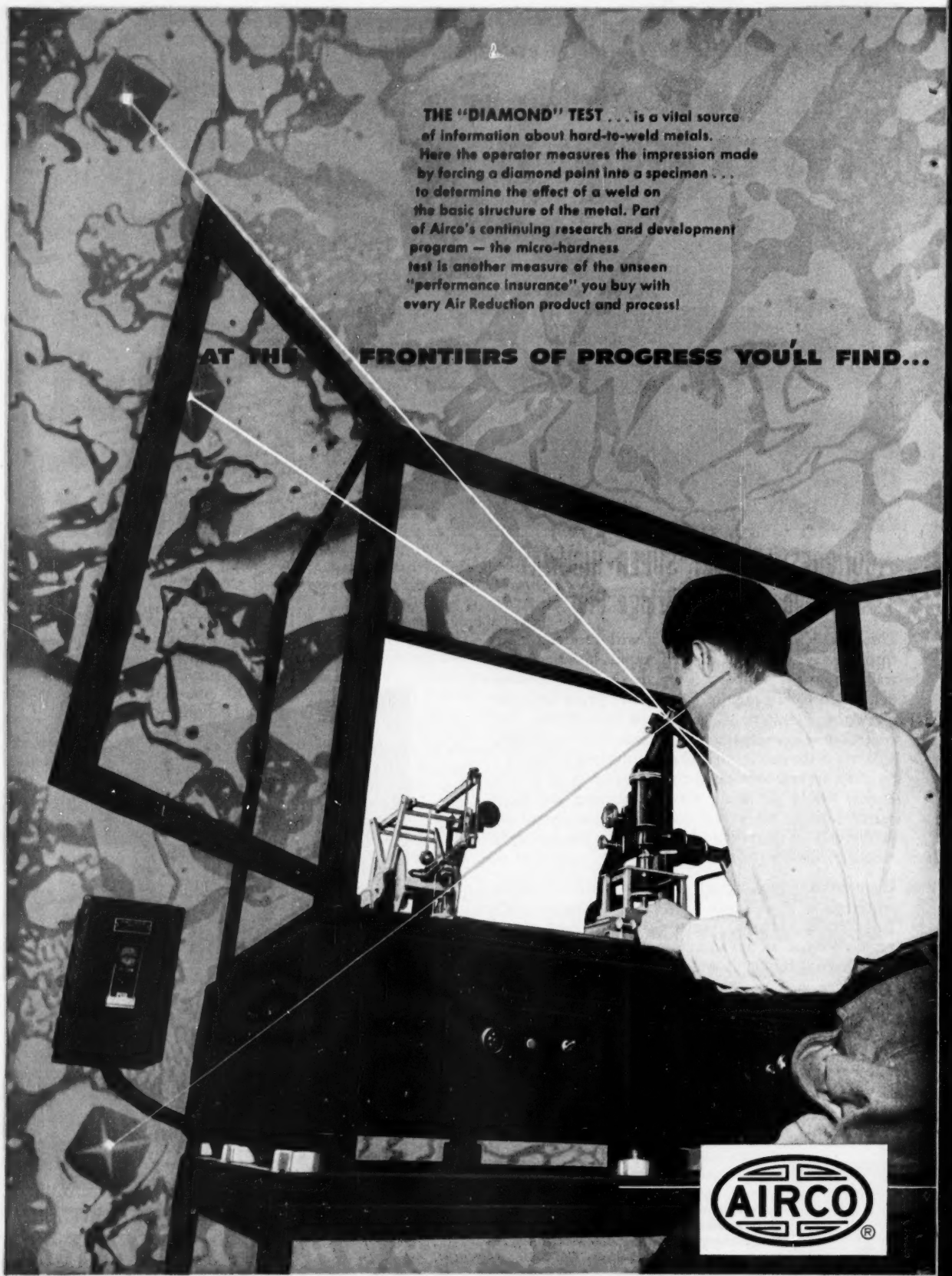
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What You Should Know About Hose

A CM&E Maintenance Feature

BY J. A. MULLER, Executive Engineer, Thermoid Co.

THE FIRST STEP in getting the most from industrial hose is to select correct hose for the job. Many users buy mainly on price. Construction men will save money by remembering that there are many special types of hose for special applications.

The standard rubber hose consists of an inner tube, a carcass of fabric or cord, and a cover. The composition of the rubber of the inner tube determines what material can be carried. The kind and the thickness (number of plies) of the carcass limits the pressures the hose can stand. The cover is designed to withstand the various working conditions encountered in industry.

Although not a component of hose, couplings are an important part of any hose system. Many types are available for general and specific uses, made from several kinds of metal. In high-pressure applications, the couplings become the most critical factor. It is easy enough to design a hose to take pressures as high as 5,000 psi by using enough steel wire reinforcement and enough rubber.

The problem is to bond the hose to the coupling. Thermoid, for instance, has solved this particular coupling problem by a design in which the steel wire reinforcement is attached positively and mechanically to the coupling.

• **When selecting** hose the following factors should be considered:

1. Material carried may attack a hose. If a petroleum product is to be carried, an oil resistant hose should be specified. Paint and some insecticide sprays take a special hose. Steam requires a special hose.

2. Working Pressure. Stay within manufacturers' limits. Some hose will handle extra pressure for a while, but it will fail more quickly and, more than likely, unexpectedly with damage to personnel and equipment and loss of production.

3. Temperature of both the material being carried and ambient temperatures should be considered. Low and high temperatures must be compensated for by special rubber compounds and constructions.

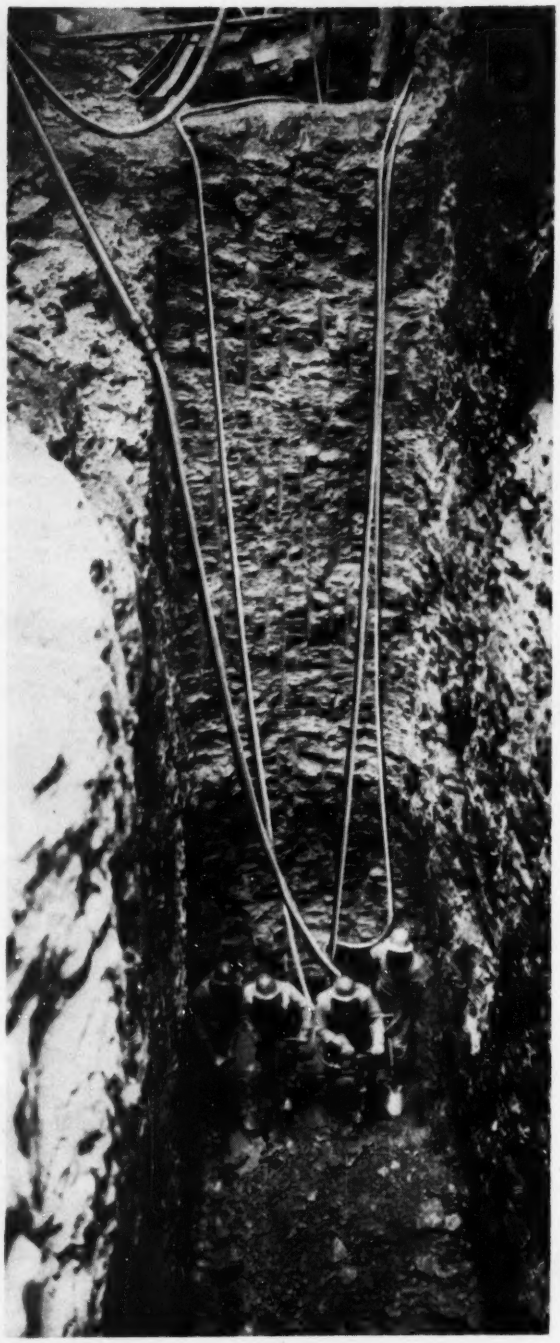
4. Carrying capacity is determined by the inside diameter of a hose. If the diameter is too small, you won't get the volume required. Too large a diameter means lower pressures.

5. Specify enough length to avoid stretching. Excessive length increases the chance of kinking.

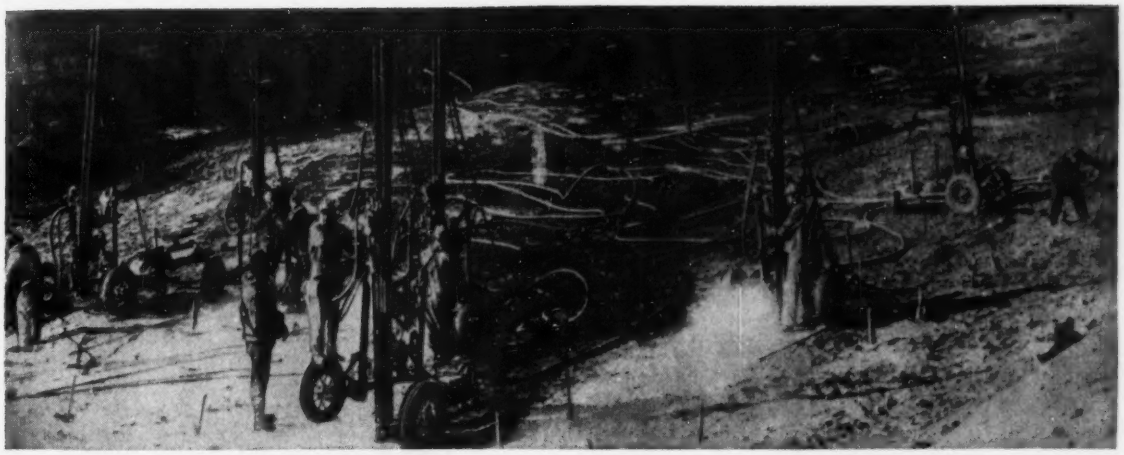
6. Couplings are as important as hose system. Even the best hose can't operate with incorrect, improperly applied couplings.

7. Severe service conditions call for abrasion-resistant covers. Some examples are: Construction, mines, quarries, heavy industrial manufacturing.

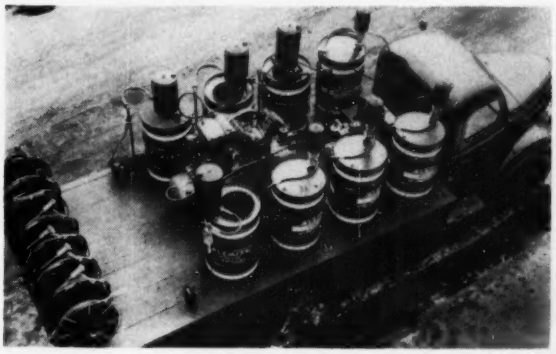
• **Maintenance begins** as soon as a roll or length of hose is received from the railroad or truck line. If



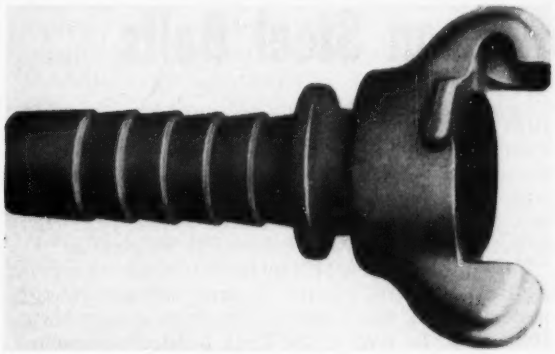
TWO TYPES of hose are in use in this deep excavation; three lines supply compressed air to pneumatic tools, and another removes water—all under severe abrasive conditions.



LINES SNAKE all over the area on this highway construction job, as a busy team of wagon drills tears into rock to be blasted. Individual hoses to drills take off from a manifold in the background, which is fed via "pipeline" from remote compressors.



PETROLEUM PRODUCTS require an oil-resistant hose, but one which is subject to little abrasion on lubrication equipment of this type.



QUICK-DISCONNECT COUPLINGS are a major part of any hose system, become a critical factor in high-pressure installations. Manufacturers can specify best type for special situations.

the hose is not being used immediately, store indoors out of direct sunlight in the manufacturer's original wrappings. Do not unwrap and leave the roll outside in direct sunlight. If the roll must be left outside, put it out of harm's way.

When the hose is to be used, unwrap and uncrate carefully. Don't slash at bindings with a knife. You may cut gashes in the new hose. If delivered uncoupled, make sure the correct type and size of couplings are used. Check the length required before cutting. Use a sharp cutting tool, and cut the hose square.

Make sure couplings are placed properly on hose, inserted all the way in, and that securing clamps or other devices are tightened. If the volume of couplings is large, a hose shop should be set up with proper tools and suitable personnel trained.

If your organization uses thousands of feet of hose regularly, the value of a hose installation and maintenance crew should be investigated. The function of this crew would be to inspect hose regularly for weak spots, cuts and worn spots and loose couplings so that actual breaks would be avoided.

Keep the hose away from hot pipes, stoves and hot pieces of equipment. If contact with hot metal cannot be avoided, cover the hot spot with asbestos.

Enemy No. 1

Although anti-oxidants are put into all modern hose covers, oxidation remains the principal enemy of rubber hose. Strong direct sunlight speeds up oxidation and should be avoided. A particularly bad offender is ozone which occurs to some extent at high altitudes and in harmful concentrations near high-voltage equipment.

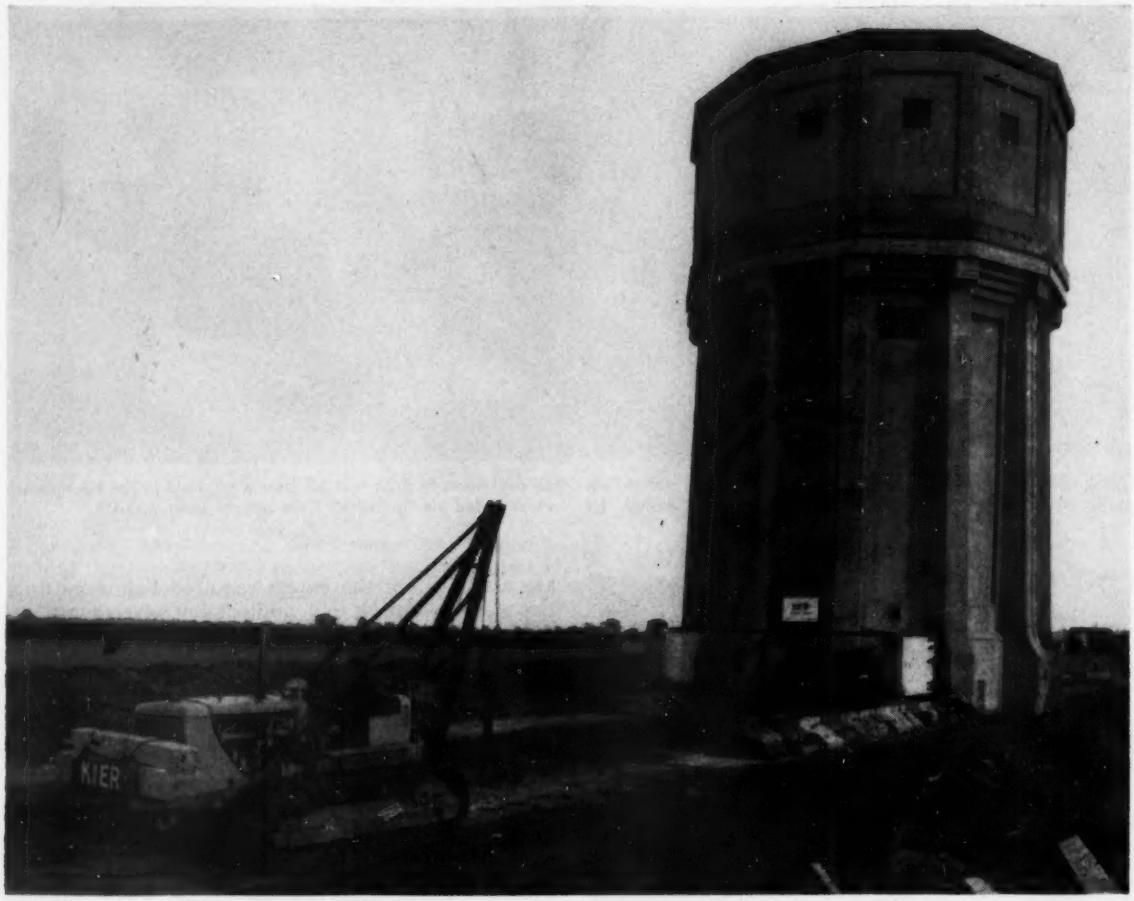
Oil and grease on a hose are bad unless the hose is specifically designated as oil-resistant.

Harsh abrasion and punctures should be avoided. It is good practice to cut out a badly worn spot before failure occurs and install a new coupling.

Take care to keep hose away from falling rocks. On construction jobs in quarries and mines, where falling material is a normal occurrence, hose should be removed to a safe area before blasting or should be protected by a guard. At road crossings hose should be carried overhead on a scaffolding or underground by conduits.

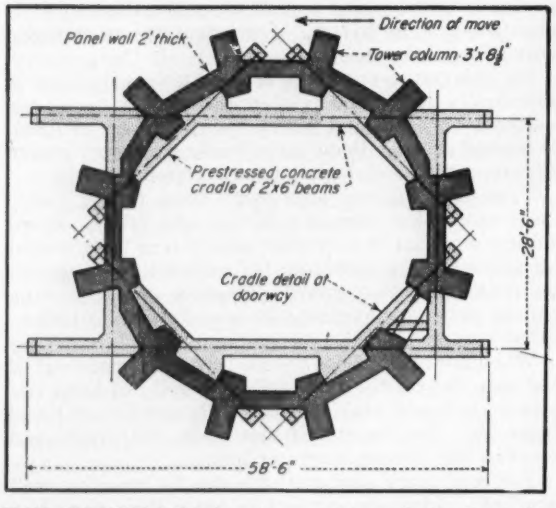
When not in use, hose should be stored inside out of the sun, flat on the floor rolled in coils of large diameter to avoid kinking. The rolls should not be so large that the weight of the coils will crush and weaken the bottom layers of hose.

For temporary storage, hose can be hung on wall brackets. Adequate support in more than one place is required to prevent sharp bends. Hooks or other supports should be thick enough so that the hose is not cut or subjected to excessive distortion.



Standing 80 ft high and nearing the end of its 810-ft trip . . .

1,900-Ton Tower Moves on Steel Balls



PLAN AT TOWER BASE shows how concrete cradle ties it together for move. Prestressing cables pass right through concrete columns of tower, making it and cradle act as monolithic structure.

SUPPORTED by a prestressed concrete cradle cast around its base, a massive 80-ft water tower has just taken an 810-ft trip to a new site near Bedford, England. The 1,900 tons of concrete and steel was rolled on hundreds of 2½-in. steel balls to make the move relatively effortless and completely successful.

Built in 1936, the Milton Ernest Water Tower of the Bedford Rural District Council was scheduled to be demolished, and a new one built on a neighboring site. But J. L. Kier & Co. Ltd., London contractors, offered to move it bodily.

The concrete tower stands 80 ft high, and its 12 columns support a 170,000-gal internal steel tank. Columns measure 3x8½ ft at the base, at which point the panel walls or diaphragms that connect them throughout their full height are 2 ft thick. The weight of the tower with tank empty and without its foundation raft, but including the carrying cradle, was about 1,900 tons.

The concrete carrying cradle was cast around the tower while it still stood on its old foundations. It was made up of a series of 2x6-ft beams of high-strength concrete, prestressed by the Freyssinet

(Continued on page 80)

Tiger Brand Wire Rope

lifts largest single-plate girder span ever erected

WARD'S ISLAND LIFT BRIDGE for pedestrians connects Manhattan and Ward's Island.

● The Ward's Island Lift Bridge connecting Manhattan and Ward's Island is reputed to be the largest single-plate girder span ever erected. This is a pedestrian bridge spanning part of the East River. The center span is 312 feet 2¼ inches long and is designed for an 80-foot lift.

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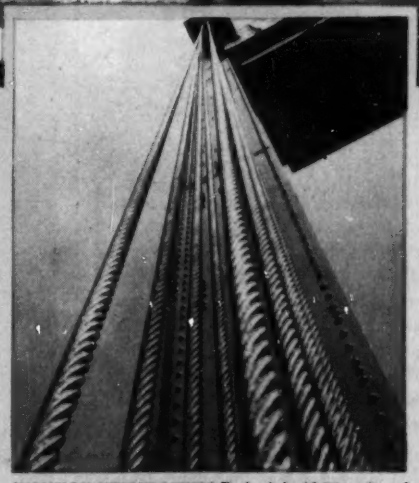

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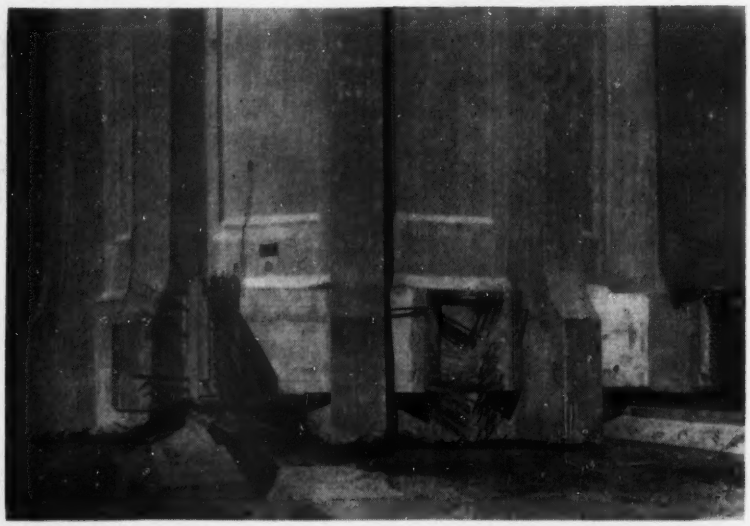
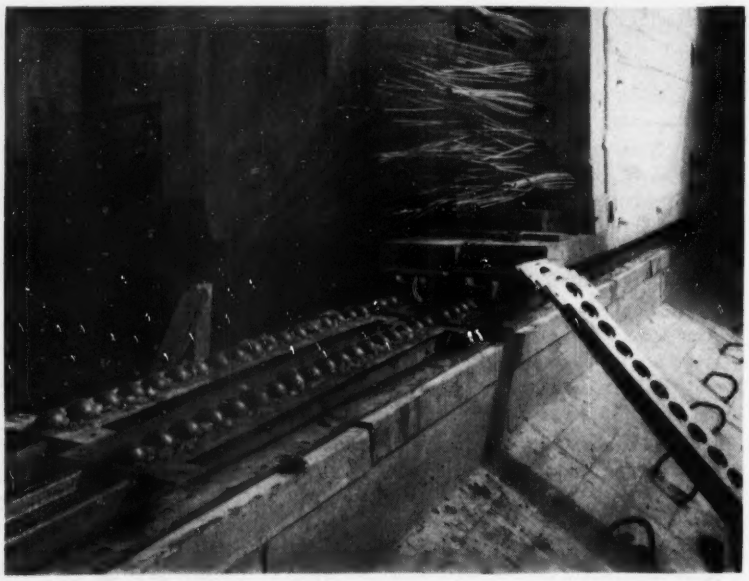
TOWER MOVES ON STEEL BALLS . . . Continued from page 78



CARRYING CRADLE is a net of prestressed concrete beams, whose Freyssinet prestressing cables can be seen projecting out through precast end blocks. Note the neat horizontal cut produced when tower was freed from its old foundations by blasting with light charges.



BEARER SYSTEM on which tower moves consists of precast concrete blocks and two levels of bullheaded rails with 2½-in. steel balls in between. Keepers space balls correctly.

method. As shown in the accompanying sketch, four of the tower columns rested directly on two main longitudinal beams 58½ ft long and 28½ ft apart, which were to act as runners for the tower during the move. The other eight columns were connected in pairs by four beams at 45 deg to the main members.

Where the cradle beams intersected the tower structure, holes were bored through the latter for the prestressing cables only. Thus the tower itself acted as an integral part of the cradle. The cable holes were cut by a relatively new method—thermic boring—in which oxygen is blown through a steel waterpipe, red hot at the end. The steel burns and creates such a heat as to melt the concrete near by, which then flows out of the hole.

The cradle's main longitudinal beams were designed to run on what were, in effect, long continuous ball races or ball bearings. These were made by placing bullheaded railway rails on their side, one above the other, with 2½-in.

steel balls in between. Spacer plates, or keepers, held the correct distance between individual balls. Two of the races, which each contained 200 balls, were placed side by side under each of the two runner beams.

The ball races rested on precast concrete blocks 6 ft wide at the bottom and 2 ft wide at the top. These were to spread the load over the full width of two concrete ribbons built from the old position to the new one, 810 ft away. Ribbon pavement was 4 in. thick on a hardcore base rolled firmly into the clay subsoil.

When the cradle and the bearer system were in readiness, the tower was cut loose from its foundations by blasting small charges. First the panel walls and then eight of the columns were severed. This left the tower standing on the remaining four columns at the main runner beams. By gradually cutting into these last four columns they were reduced to about 1-ft square, at which time they slowly gave way and shifted the load to the bearer system beneath the cradle.

Silent and Smooth

Now free, the tower was moved ahead on the slight uphill haul (1:400) by a tractor hooked to a 10-part line. Tractor pull necessary to start the 1,900-ton structure was measured at 6¾ tons, and at 5½ tons to keep it moving. Allowing for friction in the tackle, the corresponding rolling frictions of the tower must have been approximately 60 and 50 tons.

Only a limited number of balls, rails and supporting concrete blocks were used. As these became free behind the tower, they were picked up and carried to the front. This operation really governed the daily move of the tower, which was about 50 ft. The actual speed of each move was much swifter, however, and the tower would be rolled the 50 ft in a few minutes. Its movement was completely silent and smooth — resembling an ocean steamer being towed away from a wharf.

The total 810-ft trip took 29 days. During the latter part of the move, operations were somewhat hampered by long and heavy rains, which made the clay ground discouragingly slippery to work on. This made it difficult for the tractor to pull the tower and to move the supporting blocks ahead. During one such rainy spell,

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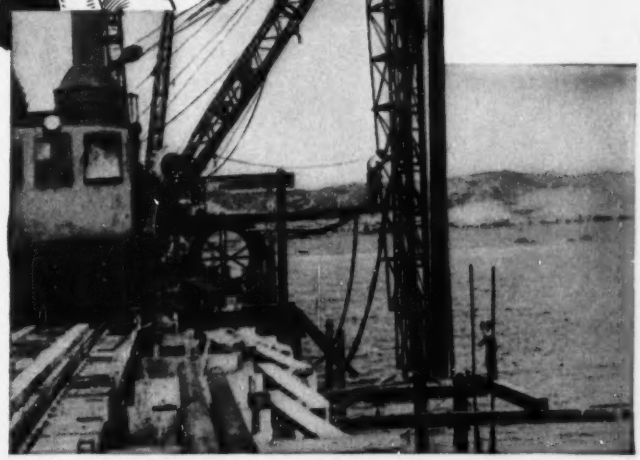

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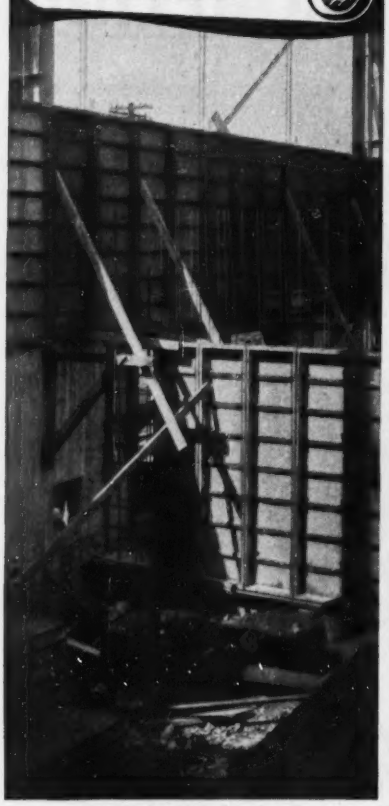

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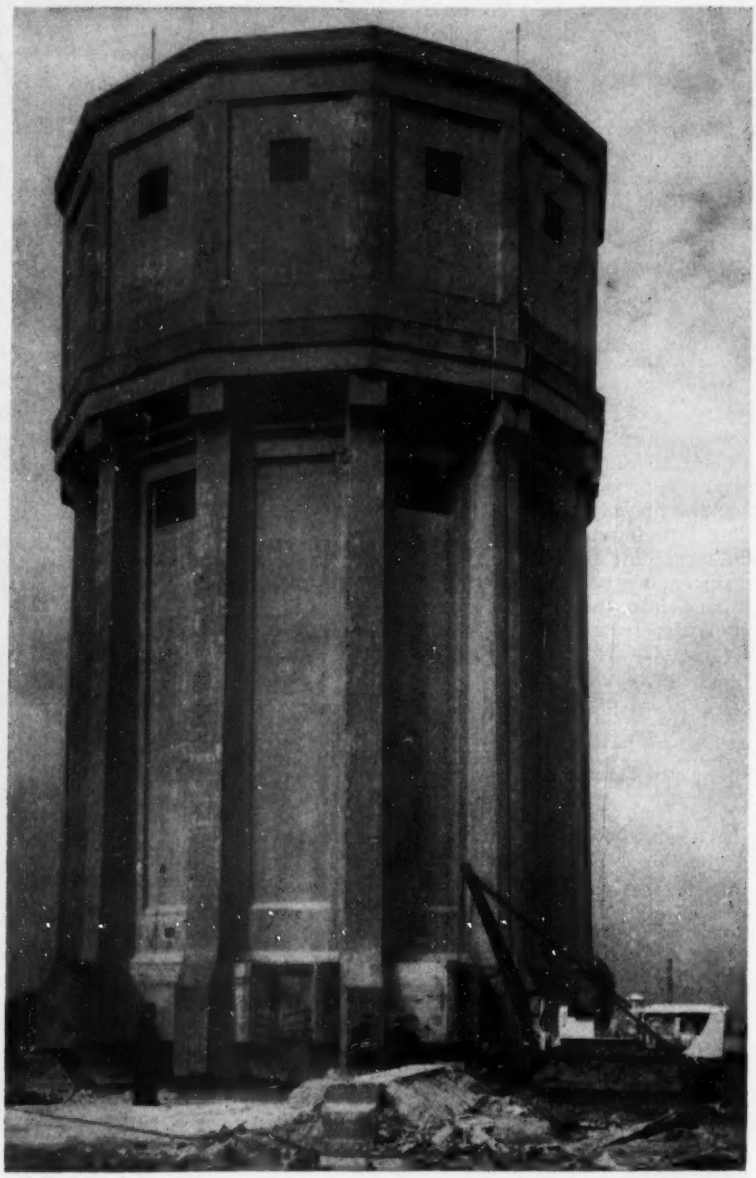


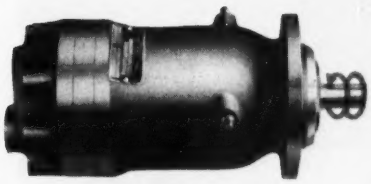
SUPPORTING BLOCKS are leapfrogged ahead by job-built A-frame on same Caterpillar D7 tractor that pulls tower on normal day's 50-ft advance. Old foundation is in foreground.

the structure settled more than 2 in. However, because of the stiffness of the runner beams, this had no adverse effect on tower or cradle. Nor was there any trouble in moving the tower on afterwards.

In preparation for the tower's arrival at its new site, foundations had already been built there. New bases for the columns had been left a few inches low, and when the tower was moved into position over them, these gaps were grouted solid so the supporting rails and blocks of the bearer system could be removed. This removal was ingeniously easy—the blocks over the new foundation had been placed on a 2-in. layer of sand, which was simply washed out to release them.

The moving operation was carried out by J. L. Kier & Co. Ltd. for Binne, Deacon & Gourley, who were consulting engineers to the Bedford Rural District Council. J. F. Dickinson was Kier's engineer responsible on the site as agent. Their E. Ingerslev was the engineer responsible for the conception and design of the moving scheme.

How Sundstrand Fluid Motors simplify power transmission in "Super Mole"



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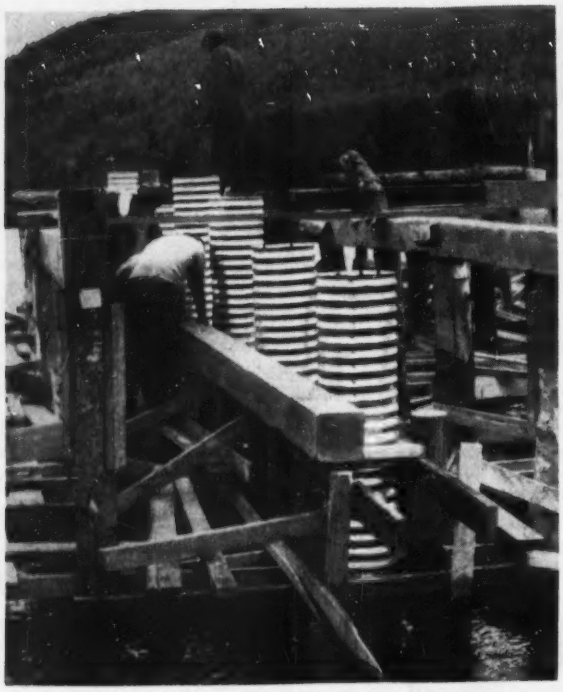
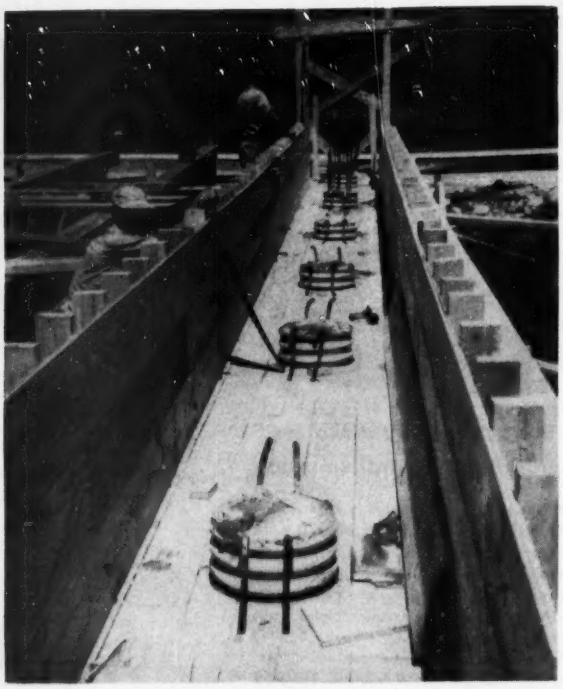
Harry Packard photos

It's a neat structure because...

Columns in Pipe Simplify Bridge Piers

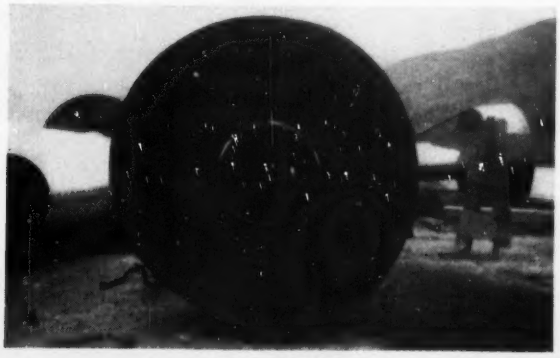


CORRUGATED STEEL PIPES have been filled with reinforced concrete, and timbers are being laid up to support pier cap forms. Contractor Moser showed ingenuity in keeping costs down.



FORMS FOR PIER CAPS enclose tops of the concrete columns, which have been cut off at the same level. Each pier and abutment ties together eight columns in a continuous cap.

REINFORCING BARS being brought in and tied into a grid before pouring of the 14-in. bridge deck begins. Bridge is only a small one, some 65 ft long, but an important part of a primary highway in Maine. Although the water it crosses is relatively shallow, cofferdamming and the related formwork for piers would have been more costly and time-consuming than the pipe columns.



FOOTER on the bottom of each pipe is 42 in. in diameter and 20 in. deep, makes a broad and stable base when packed with concrete.

THIS BRIDGE is a small one—for two traffic lanes and only some 65 ft long. But its two concrete piers had to be built in the shallow water of a small inlet across the path of the Roosevelt Trail between Bridgton and Fryeburg, Me.

To avoid the expense and time involved in the construction of a cofferdam and extensive formwork, Contractor Edward Moser, Portland, decided to support the piers on simple reinforced concrete columns. This was done by setting lengths of corrugated steel pipe on end where the piers were to be located and filling them with concrete.

The steel pipe is 15 in. in diameter and 15 ft long. Each pipe has a 42-in. footer on the bottom 20 in. deep. The steel tubes were sunk to solid ground, concrete poured into the footer with tremie, and the remainder

(Continued on page 88)

FIFTEEN-FT LENGTH of 15-in. U. S. Steel pipe is lowered into water by a crane. Workmen guide its descent with ropes for exact spotting. Underwater concreting was done with tremie.

SINCE 1907

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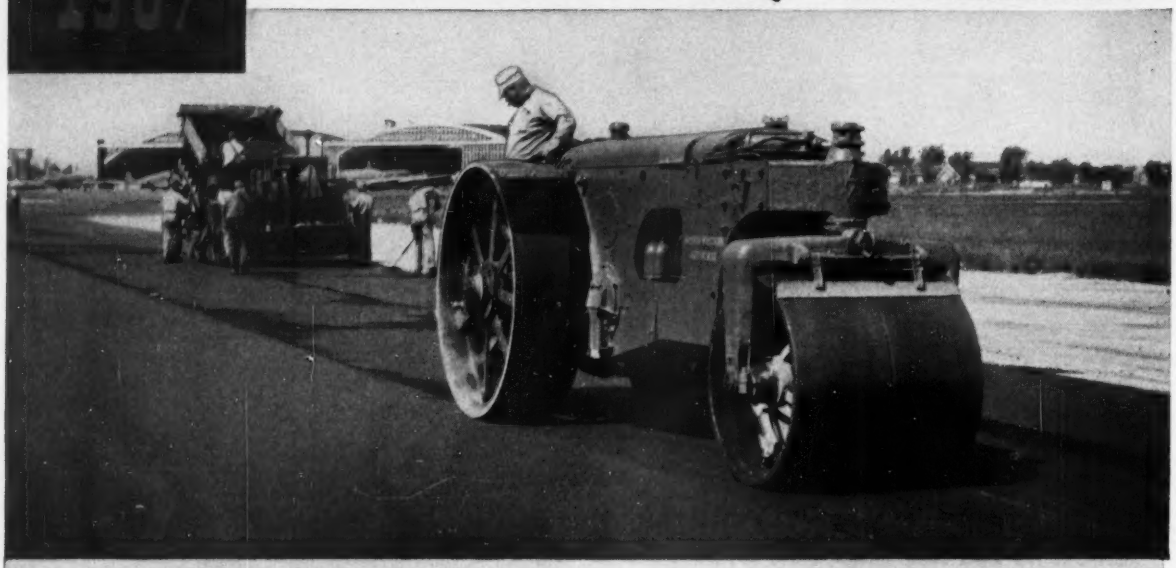

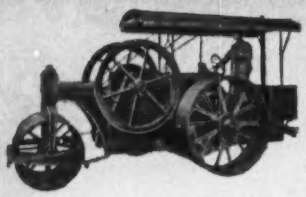

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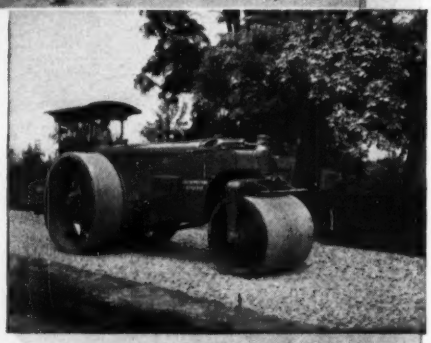

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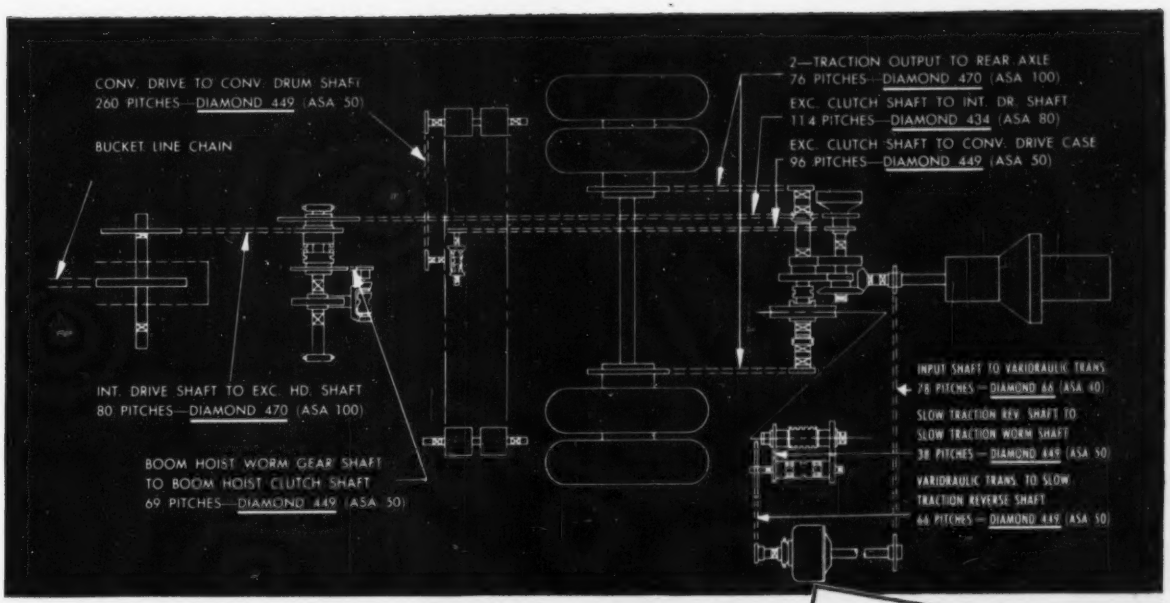
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INT. DRIVE SHAFT TO EXC. HD. SHAFT
80 PITCHES—DIAMOND 470 (ASA 100)
BOOM HOIST WORM GEAR SHAFT
TO BOOM HOIST CLUTCH SHAFT
69 PITCHES—DIAMOND 449 (ASA 50)
2—TRACTION OUTPUT TO REAR AXLE
76 PITCHES—DIAMOND 470 (ASA 100)
EXC. CLUTCH SHAFT TO INT. DR. SHAFT
114 PITCHES—DIAMOND 434 (ASA 80)
EXC. CLUTCH SHAFT TO CONV. DRIVE CASE
96 PITCHES—DIAMOND 449 (ASA 50)
INPUT SHAFT TO VARIDRAULIC TRANS.
78 PITCHES—DIAMOND 66 (ASA 40)
SLOW TRACTION REV. SHAFT TO
SLOW TRACTION WORM SHAFT
38 PITCHES—DIAMOND 449 (ASA 50)
VARIDRAULIC TRANS. TO SLOW
TRACTION REVERSE SHAFT
66 PITCHES—DIAMOND 449 (ASA 50)

9 DIAMOND Roller Chain Drives—on the Versatile Parsons 88 Trenchmobile

IMPORTANT DIAMOND ADVANTAGE—PITCH HOLE PREPARATION

Maximum rigidity of links insured by special pitch hole preparation for 100% effective bearing area of pin and bushing. Longer life, smoother operation.

SHOT-PEENING SINCE 1944

Diamond Chain has long recognized that certain types of internal stressing of chain parts would increase fatigue resistance. To this end, link plates have been specially processed and chain rollers and other parts have been shot-peened since 1944.

• Ditch digging is tough continuous work, requiring heavy duty construction and high durability of all components.

As the sketch above shows, Diamond Roller Chains provide for dependable power transfer from power supply and shaft to shaft. Great reserve strength, positive action, long-life reliability are important to maker and user. Maximum freedom of selection of shaft locations facilitates design and adds to accessibility.

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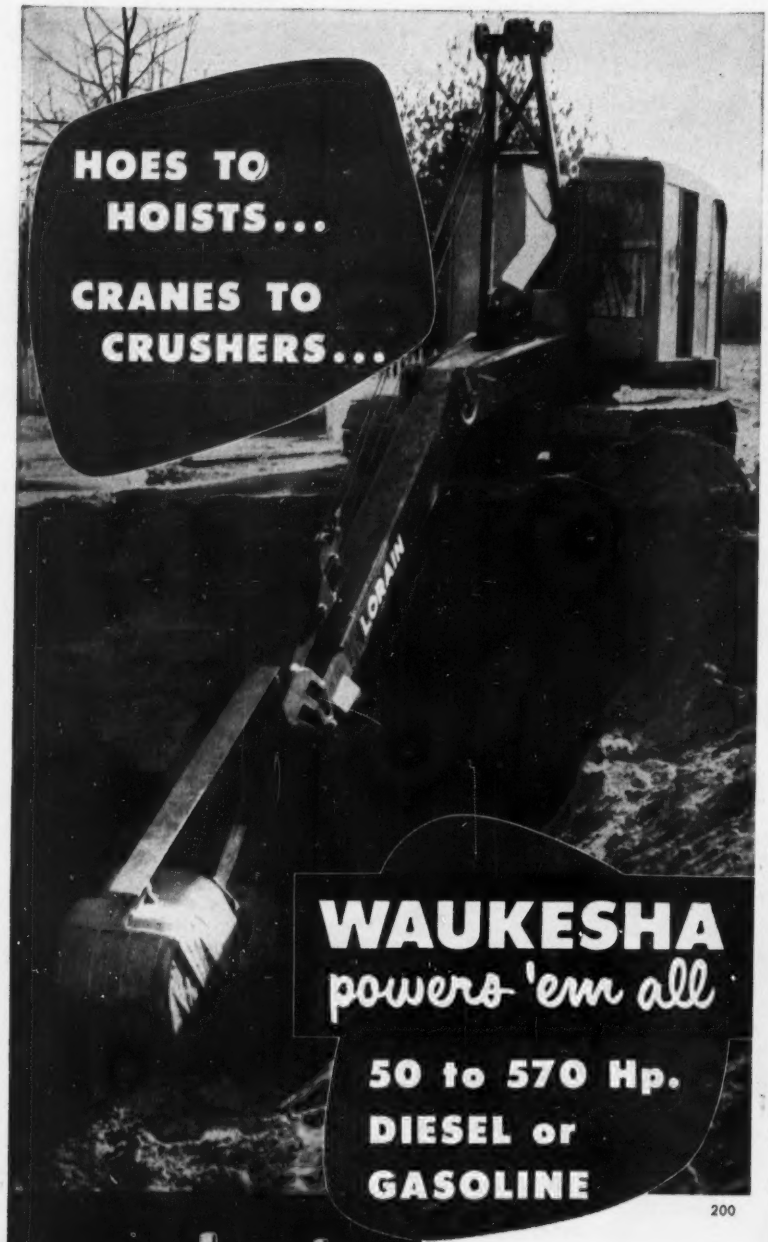

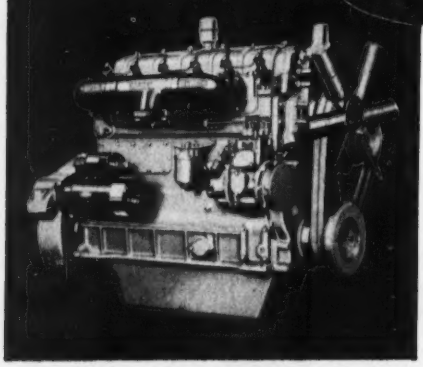

135-DKB Diesel Engine—6 cylinders, 4¼-in. x 5-in., 426 cu. in. displacement. Max. hp. 147 @ 2800 rpm.

● Specially adapted to general contractors' needs, Waukeshas handle every load demand easily and eagerly, and with power to spare. Both the Diesels and gasoline engines are easy to start and operate. Waukeshas turn out more work, steadily and speedily. Economical to fuel and maintain. 50 to 570 hp. gasoline or Diesel. Get the complete Waukesha performance story in Bulletin 1079.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
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COLUMNS IN PIPE . . .

Continued from page 85

of the pipe filled with reinforcing steel in place.

Columns for the piers are about 12 ft long. They were cut off across the top, as necessary, to meet the level of the bridge. After all had been concreted, forms were placed and each row of eight columns tied together into a single pier with a reinforced concrete cap. The two piers are 25 ft apart, and each one is 20 ft from an abutment. Abutments also were built by first constructing concrete columns with the aid of steel pipe.

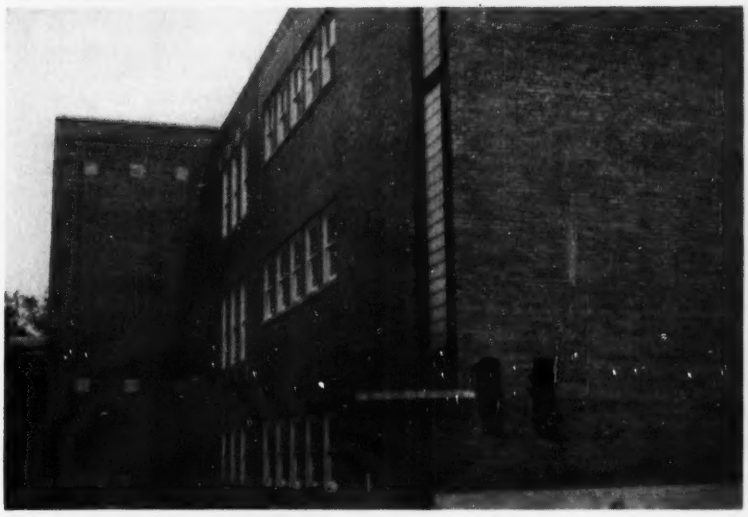
Following construction of the piers and abutments, formwork and reinforcing steel were placed and a 14-in. floor slab poured. Concrete guard rails completed the structure.

Construction of the bridge was by subcontract under a contract held by Frank Rossi, Gardiner, Me., with the Maine State Highway Commission for several miles of new highway connecting with the bridge. Lawrence Morton is project engineer for the state.

Ounces of Safety

THE 13-OZ PLASTIC HARDHAT held by John W. Stark, an ironworker for Dravo Corp., took the blow from the 26-in. pinchbar he is holding in his right hand which fell 29 ft before it landed on his Skullgard, a Mines Safety Appliances product. The safety hat was pierced by the falling bar but undoubtedly saved the life of its wearer who received a slight head cut.

Steel shores fit neatly into . . .



Holes in wall, hold two floors for . . .

School Building Corner Modification

UNIQUE SHORING was employed to support the northwest corner under two floors of the three-story, masonry-wall McFarland, Wis., school building while modifications were made to the first floor walls and foundation to enlarge an entrance.

Sections of wall and foundation of the first floor had to be removed —without disturbing the two upper floors. The first step then was to shore up the corner in such a manner that an existing floor slab and stairway could be lowered to meet the new construction.

This ruled out the possibility of cribbing up from the ground and from an inner floor and needling through the wall to support the heavy upper floors. Also, the contractor could not afford to take the chance of ground settling under the cribbing, which might result in cracked walls.

Fred G. Rockwood, superintendent on the job for the contractor, Marshall Erdman & Associates, Madison, Wis., decided to use the existing foundation as shoring support until the new steel was in place and permanent supporting

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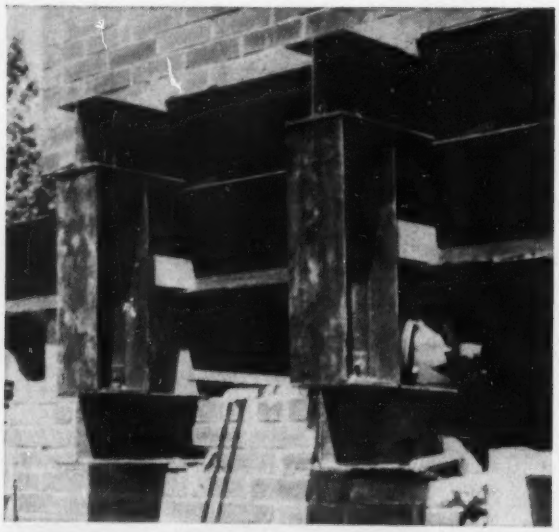
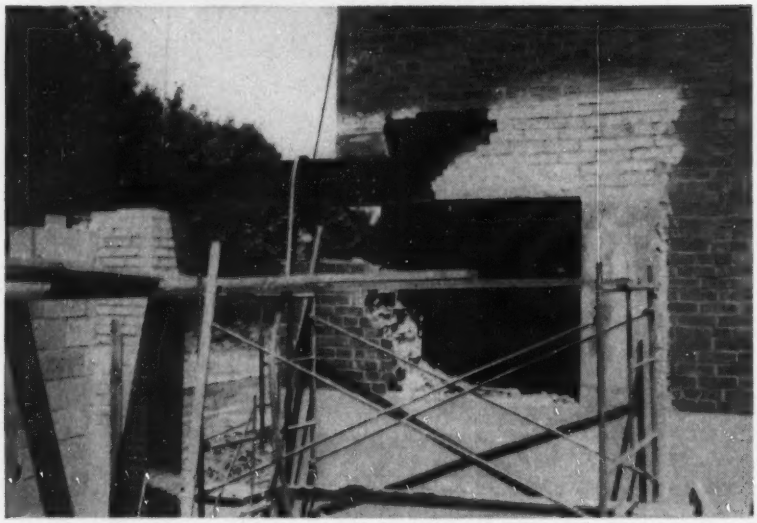
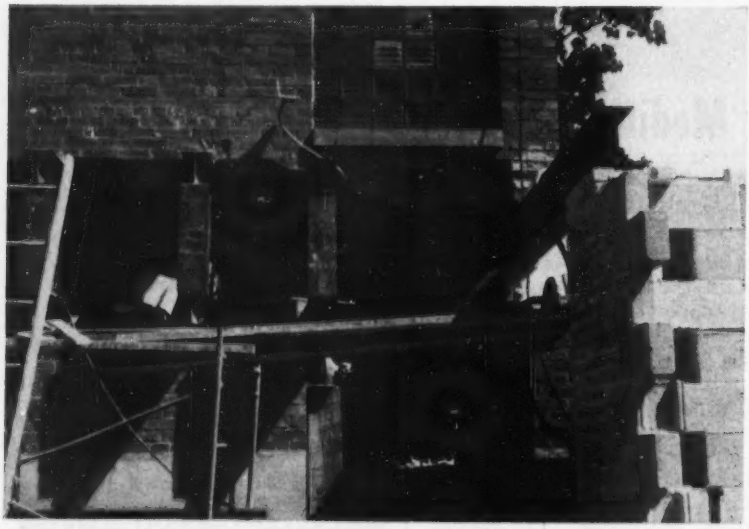


OPEN - CENTER SHORES permit new structural I-beam to be set into position after wall areas have been broken out to clear it. Wood wedges maintain small separation for later dismantling.



NEW CORNER PIER and structural I-beam now support the building corner. Old foundation and some of wall remain for removal. Jack helps carry load until pier has set.



NORTH WALL was holed through and shores utilized as in adjacent wall. Note second permanent I-beam passing through the shores and tied into the one supporting the west wall.

walls built in above the steel.

Two vertical slots were broken through the west wall back of the corner, large enough to receive comfortably the sections of I-beam that formed the shores. Shores were in the form of a rectangle. A section was laid horizontally at right angles across the wall. A vertical section was set up at each end and another horizontal section laid across the top of the two verticals—with all sections joined by bolts to prevent possible shifting.

The supporting wall surface had been prepared beforehand by placing a concrete pad and a 1-in. thick steel plate on which the shores were set. Steel-plate wedges set the shores tightly against the upper bearing points.

With the shores in place, large sections of the wall were removed to make room for a new steel I-beam to support an extended corner. The outer end of the I-beam rests on a new pier, and the opposite end was tied into the wall that remained. After the new supporting pier had set sufficiently to take the load of the west wall, the shores were removed and the remainder of the old wall under the steel beam broken out.

Modifying of the north wall section was done in like manner, except that four shores were required because a longer span of wall had to be removed.

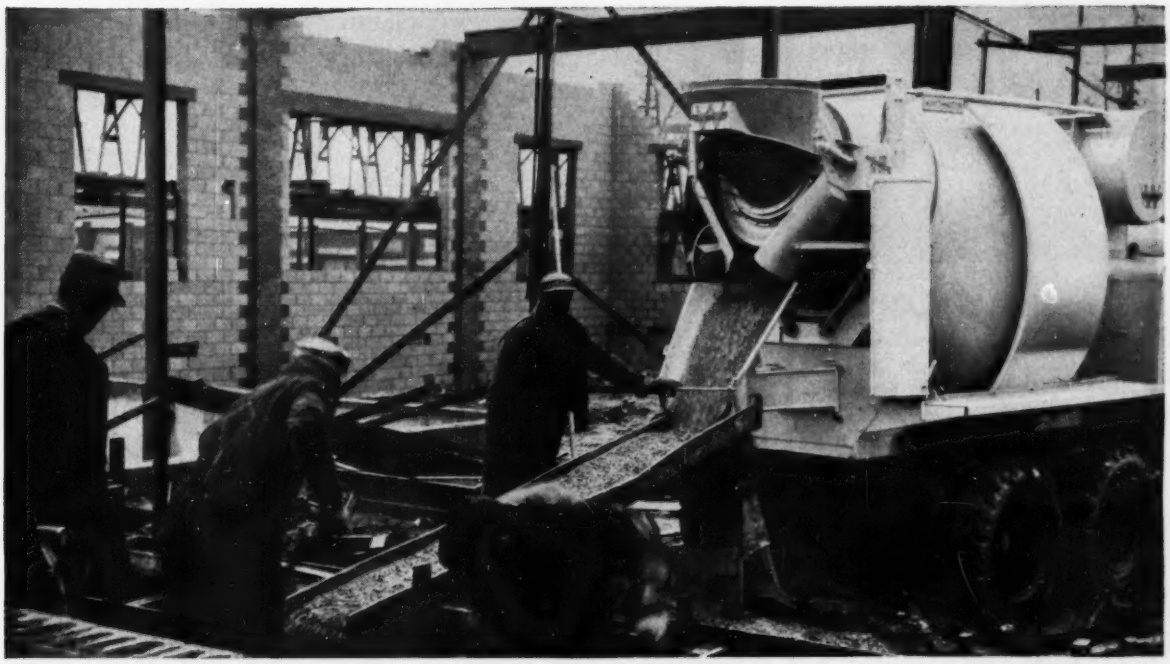
The rectangular shore assemblies made it possible to pass heavy steel beams through them without interference, and bricklayers could construct some new wall sections with the shores in place.

Now Try This

FOUR SCRAPERS recently were operated in a unique combination of two teams on an airport extension job at Morris Field, Charlotte, N. C., by J. C. Critcher, Inc., of Asheville.

Critcher has one Euclid twin-powered scraper and one Euclid single-engine scraper work together as a pair. First, the "twin" push-loads the single-engine unit —which then pulls out, swings around and assists the twin in loading.

The contractor says this method beats the twin-powered scrapers self-loading or push-loading each other while the single-engine scrapers are push-loaded by a crawler tractor. The airport job was performed in dense red clay.



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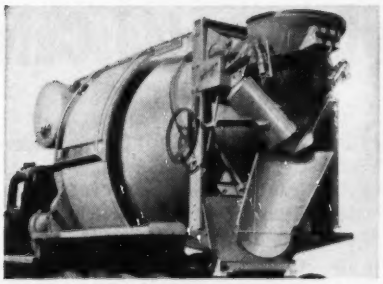
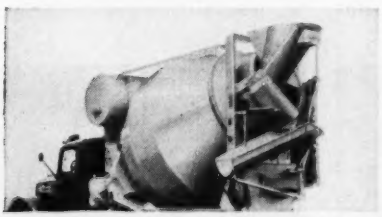


MODEL LC—standard equipment: top hatch loading door, closed end charging door, running boards, side shields. Approximate weight—7100 lbs.



MODEL LO—standard equipment: open end drum with fixed hopper, inspection plate, no side shields or running boards. Approximate weight—6300 lbs.

In Worthington Truck Mixers, engineered weight distribution brings the center of gravity well forward of the rear axle—enabling you to carry the maximum legal payload. Scale weight is held to a minimum, with no sacrifice in strength or operating efficiency.

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LONG CULVERTS will be buried beneath fill 144 ft high on Alabama highway relocation. Triple installation is of 84-in., hot-dip galvanized corrugated plate pipe 512 ft long.

Heavy Corrugated Culverts

THERE'S A HIGH FILL across the deep gorge of Hurricane Creek on relocated US 31 near Cullman, Ala.; 144 ft to be exact. And there's a 512-ft triple culvert of 84-in. corrugated pipe beneath it. This highest known fill over such a structure provided a pioneer test on installation, settlement and deflection.

Each of the three 512-ft lengths is an Armco Multi-Plate pipe made up of 48 ft of 8-gage material at the inlet end, then 24 ft of 7-gage, 24 of 5, 24 of 3, 256 of 1, 32 of 3, 24 of 5, 24 of 7 and 56 of 8. Four quadrant plates make the pipe circumference, and longitudinal joints are staggered. There are four bolts per lin ft in all joints except those in the 256 ft of 1-gage plate, which carries six bolts per ft.

HYDRAULIC JACKS elongate pipe 3% vertically before backfill is placed. Timber posts will hold pipe in this sprung position.

COMPRESSION CAP at top of post is designed to crush and let pipe take up the load as the fill is built higher and higher.

SELECT BACKFILL brought in by trucks is compacted around pipes, which are on 20-ft centers. Air tampers, haul trucks and sheepsfoot drawn by wheel tractor do the compacting.

Take Creek Under High Fill

Pipes are on 20-ft centers and on a 2½% slope. They rest on an even bed of select granular material compacted to at least 100% density that fills a 2-ft trench excavated in the original ground.

Pipe plates, 6x8 ft and weighing as much as 700 lb, were assembled in place by an A-frame on a winch truck. Then the 84-in. culverts were elongated 3% vertically by hydraulic jacking. Timber 8x8-in. posts on 3-ft centers throughout the 1-gage section, and on 6-ft centers in the others, held the pipes in this out-of-round position.

Posts were topped with a soft pine compression cap to let the pipe deflect downward and outward later to build up the necessary side support to take the load of the fill above. Compression caps were four superimposed pieces of 2x8-in. plank laid flat. This minimized the splitting that would have occurred under load had a single piece been used.

After the pipes had been sprung and painted outside with two coats of Bitumastic No. 50, they were buried with select backfill compacted to 100% density. General fill was placed above this. When it had reached a level 10 ft above the culvert, a 7x7-ft trench was dug directly over each pipe and backfilled as loosely as possible. Purpose of the trench was to let arch action develop over the culvert and reduce the load on the pipes, whose allowable deflection was 5% below original axis.

Trenches were dug with a back-

(Continued on page 96)

PRESSURE CELL measures load on individual post. Armco engineers put cells and strain gages in pipe to get high-fill culvert data.

just nail 'em in... pour your concrete

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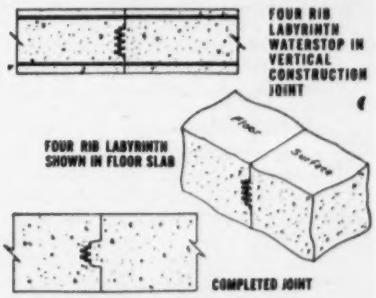

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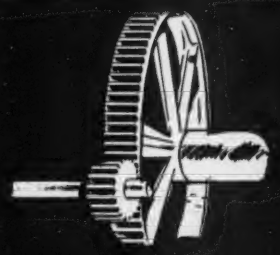


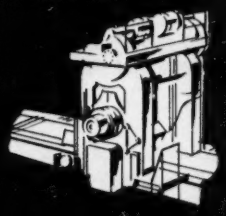
AMSCO HF-60 for moderate impact and abrasion and has outstanding weldability particularly for vertical applications. All diameters, coated only. Microstructure: martensitic steel.

AMSCO FARMFACE or AMSCO CHROMEFACE for farm or industrial use. Excellent resistance to low stress sliding abrasion. All diameters, bare and coated. Microstructure a high chromium austentitic iron containing manganese and silicon, and consisting of hard chromium carbides in a matrix of austentite.

AMSCO No. 217 for abrasive service up to 1000° F. All diameters, bare and coated. Microstructure: an air hardening martensitic iron alloy containing chromium and tungsten.

AMSCO HF-40 for severe abrasion, moderate impact. Deposits have excellent weldability. All diameters, coated only. Microstructure: martensitic cast iron.

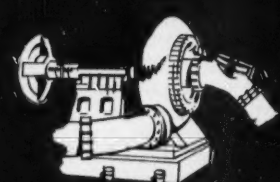
AMSCO AIR-HARDENING for abrasion and severe impact. Deposit can be forged to sharp edge without loss of hardness. All diameters, bare and coated. Microstructure: martensitic steel.



AMSCO AW-79 will meet most requirements for better control of wear where abrasion and impact are important factors—plus all the advantages of automatic welding. Especially suitable for rebuilding and hardfacing tractor rollers, steel wheels, sheeting rolls, dredge pins, as well as dozens of other automatic applications. [illegible]" and [illegible]" in 22½" ID., 100 lb. coils.

AMSCO V-MANG, bare or coated, for build up and repair on manganese steel castings exposed to impact; work hardens—[illegible]". Microstructure: austenitic manganese steel.

AMSCO CO-MANG, coated only, for build up and repair of manganese steel castings exposed to severe impact. Deposit has excellent impact resistance; work hardens—[illegible]". Microstructure: austenitic manganese steel.



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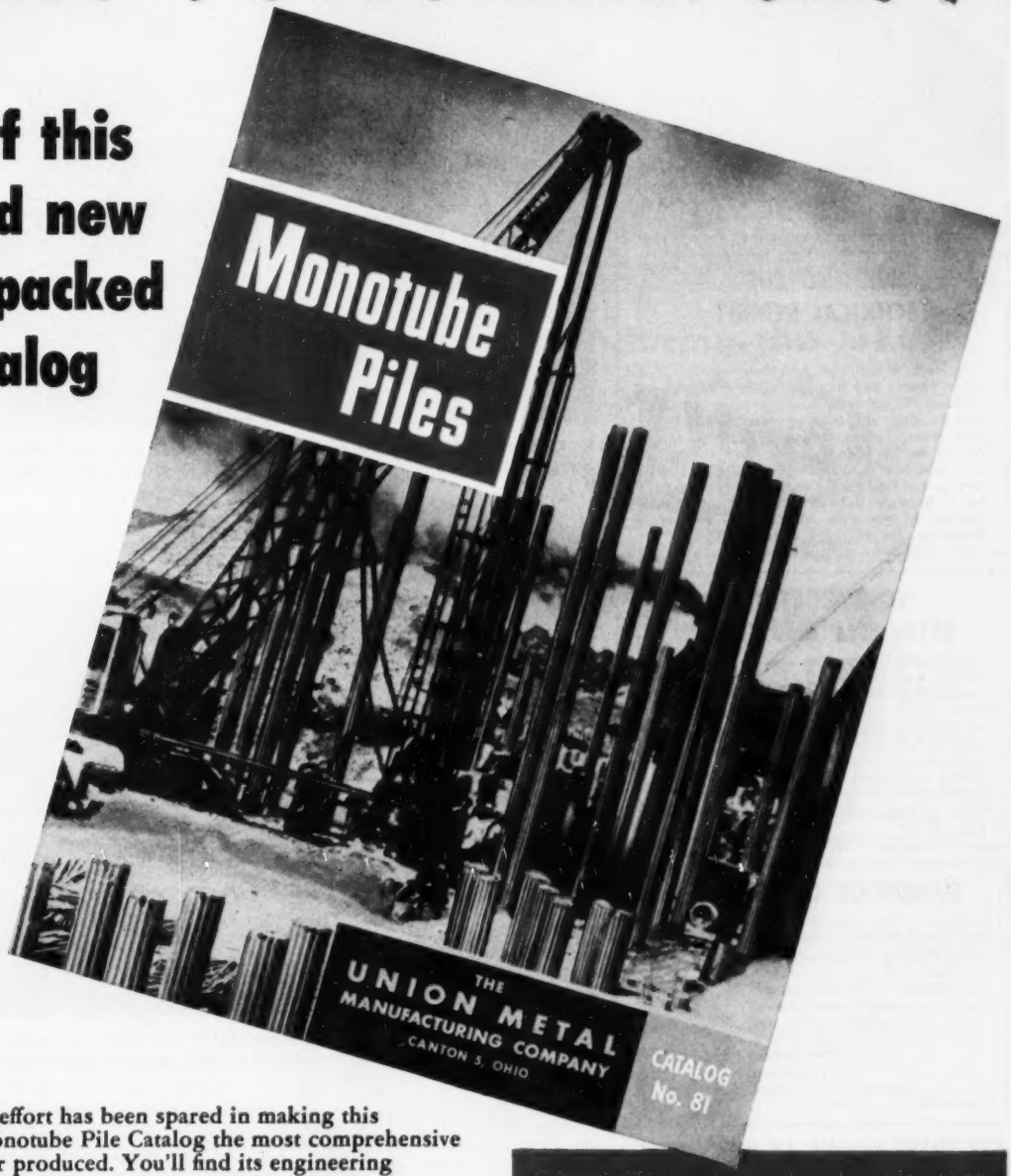

NO effort has been spared in making this new Monotube Pile Catalog the most comprehensive one ever produced. You'll find its engineering and test data, descriptive material, numerous application photos, etc., to be interesting, helpful and valuable as a reference source. For your copy, use the handy coupon or write to The Union Metal Manufacturing Co., Canton 5, Ohio.

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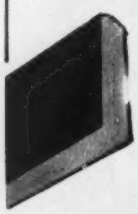

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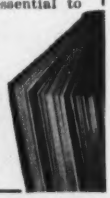

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HIGH-FILL CULVERTS . . . Continued from page 93

NORTH END OF JOB was complicated by hard rock cliffs that had to be blasted after preparation with wagon drills. This 600-ft stretch of fill was part of an 11-mi relocation.

SOUTH END OF JOB furnished fill material that was mostly soft sandstone and dirt. But even some of this had to be drilled and blasted. Sidewalk superintendents watch it all.

FILL MATERIAL is loaded by 1½-yd Speeder shovel into 15-yd Euclid truck for haul to the embankment, as Caterpillar D8 dozer waits to clean spillage. This rock is soft sandstone.

hoe. The machine first opened up a 10-ft section and stockpiled excavated material alongside. Then the hoe backed down the line to dig the rest of the trench, dumping forward to backfill the excavated section as it went.

The 144-ft high fill at the culverts is 68 ft wide at the top and some 600 ft long, with 1½:1 side slopes. It called for 500,000 cu yd of material. This was obtained from both ends of the job; the material from one being largely hard rock, while that from the other was soft sandstone and earth. Procedure was to lay the rock in layers on the fill, then fill the voids with sandstone and earth. Worked over by a crawler dozer and two- and three-drum sheepsfoot rollers in tandem, the sandstone broke up and compacted nicely. Moisture content of the fill was maintained between 11 and 18%.

Haul from both sides of the gorge was down grades that averaged 18 to 20% and were as steep as 30. Work on the rocky side was additionally complicated by overhanging cliffs that had to be blasted away. One was 60 ft above creek bottom and the other was at the 90-ft level and reached back some 40 ft. After this hard rock was blasted, it was spread and rolled into the fill.

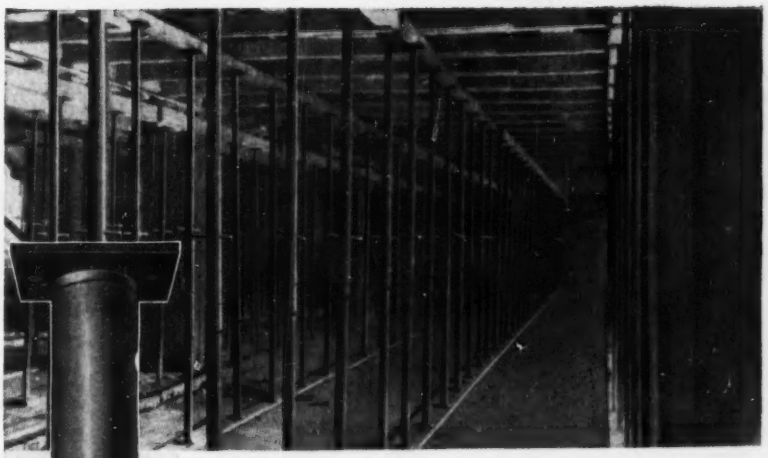
Equipment Spread

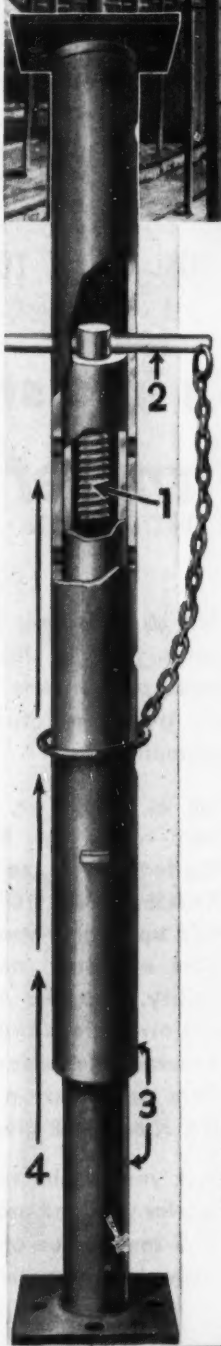
Fill was generally placed in 3-ft lifts. Progress averaged 10 ft of height per week with the following equipment: One Lorain 2-yd shovel, one Link-Belt Speeder 1½-yd shovel, seven 15-yd Euclid rear-dumps, three LeTourneau pans, four Caterpillar D8 dozers, one Allis-Chalmers HD-19 dozer, one HD-19 pulling a Cat ripper, two sheepsfoot rollers.

Because of the heavy volume of water in the gorge during rains, both ends of the culvert were protected. The fill slope at the inlet was covered with grouted riprap carried up 25 ft above the pipes, which is the estimated maximum backwater elevation at maximum flood stage. The base of the riprap tied in to a cutoff wall constructed to a depth of 12 ft or to solid rock. A fence of steel piling with four ¾-in. galvanized wire cables on 9-in. centers was stretched across the stream to deflect boulders.

At the outlet, an 80-ft length of the stream bed was excavated about 11 ft deep and backfilled with boulders. The top 1 ft of this apron was grouted over the entire

(Continued on page 99)





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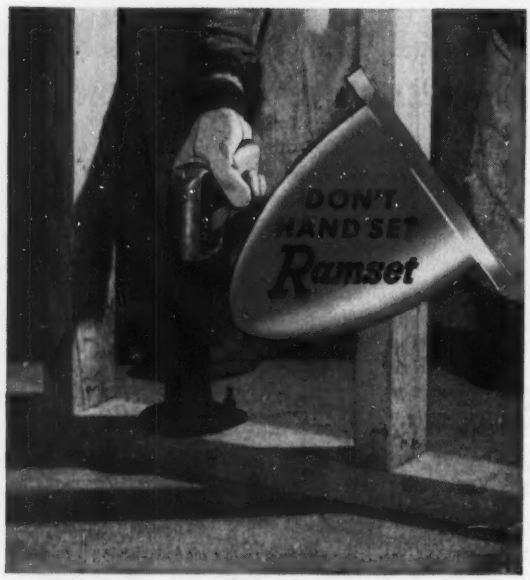

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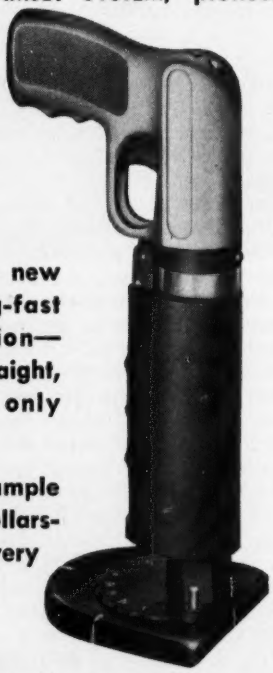

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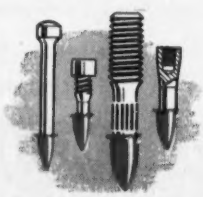

* Names of these RAMSET users and others in your locality available on request.

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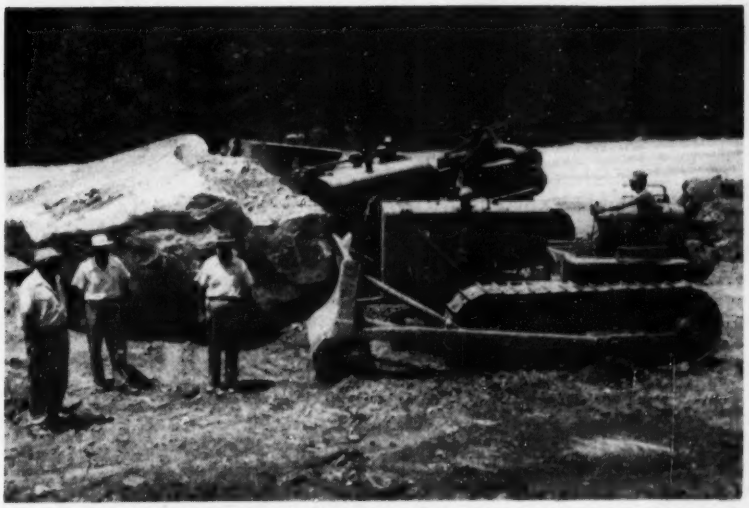
FILL IS HAULED down grades as steep as 30% in heavily loaded trucks. At times it was necessary to go around the nose of the hill on the return trip back to the shovel.

ROCK IS LOOSENED by Cat ripper drawn by Allis-Chalmers HD-19, in preparation for shovel loading. While rock is hard, it is quite thinly laminated so breaks up rather easily.



BOULDER IS SHOVED by trio of bulldozers—two D8s and one HD-19—to obtain material for the 500,000-cu yd fill. This big block of soft sandstone will be broken up for use.

(Text continued on next page)

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DIRT IS MOVED by D8-drawn Carryall scraper that hauls material from south end of the job. Another similar rig and a Tournapull also helped bring in dirt for the high fill.

FILL IS RAISED 44 ft, still has 100 ft to go. Fill and metal culverts saved estimated $100,000 over alternate designs considered (plate girder bridge, concrete arch, concrete culvert).

area to a width of 60 ft, or 10 ft beyond the center of each of the two outside pipes. Concrete energy dissipators were built 30 ft beyond the culvert. The fill slope was protected to 15 ft above the pipes with a riprap blanket whose toe tied in to the grouted apron.

After the fill had been completed, the timber posts were removed from within the culverts. Then the bottom third of each pipe was paved with two courses of asphalt; a rich Type 1 mix for 1 in. over the corrugations, topped with a 1-in. layer of cold flux limerock asphalt. A double coat of Koppers Bitumastic No. 50 from paving to mid-diameter completed the culvert installation.

The Alabama Highway Department had let separate contracts for (1) pipes and select backfill around them, and (2) for the high fill. The first went to A. L. Crow Construction Co., Selma, Ala., on a bid of $153,500; the second to Carlton Contracting Co., Albany, Ga., at $370,000. Armco Drainage & Metal Products Inc. assembled the three pipes for Crow under the supervision of W. I. Floyd. Carlton's job was directed by Superintendent Ed Smith. H. D. Burnum and M. Curtis Davis were division and resident engineers for the state.

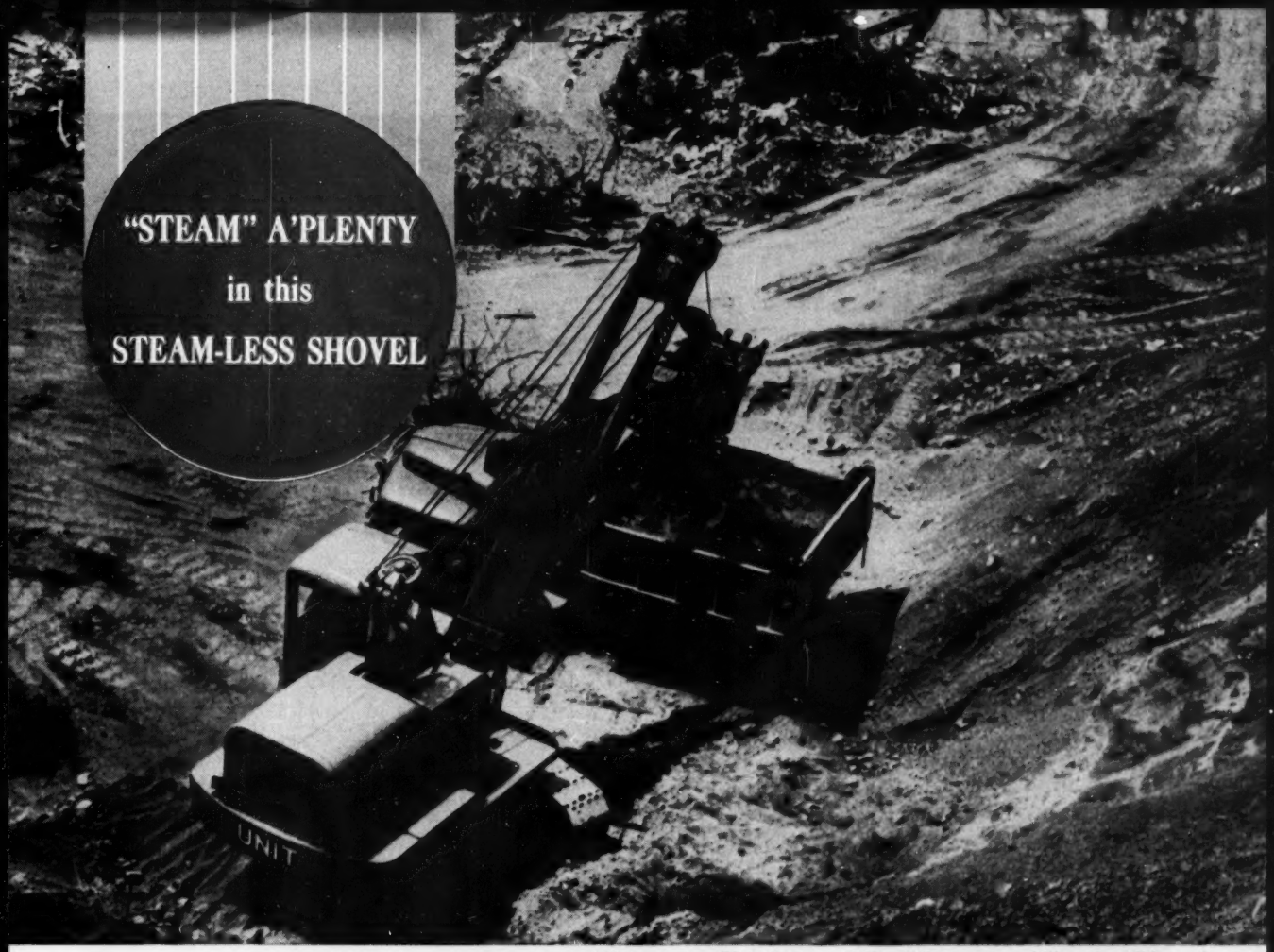
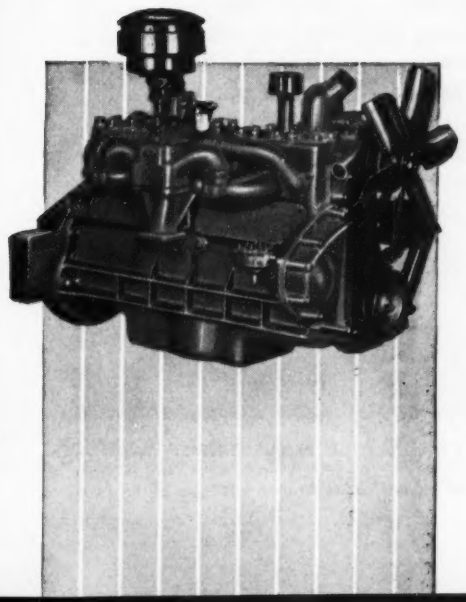


Photo courtesy Unit Crane and Shovel Corporation, Milwaukee, Wisconsin

...more work at less cost with Chrysler power and Chrysler torque converter



Today, all over the country, gasoline-powered versions of the old steam shovel are piling up record after record for volume output, speed and economy of operation.

In the vanguard of modern earth-moving equipment is Unit's model 614 one-half yard shovel, powered by the Chrysler Model 16 Industrial Engine and featuring the Chrysler torque converter as standard equipment. Unit operators find this an ideal combination since, in giving them fast, dependable power without risk of stalling, work output is *increased* while fuel consumption is actually *decreased*. Moreover, the smooth application of power through the torque converter eliminates shock loads to engine and equipment, thereby reducing maintenance costs.

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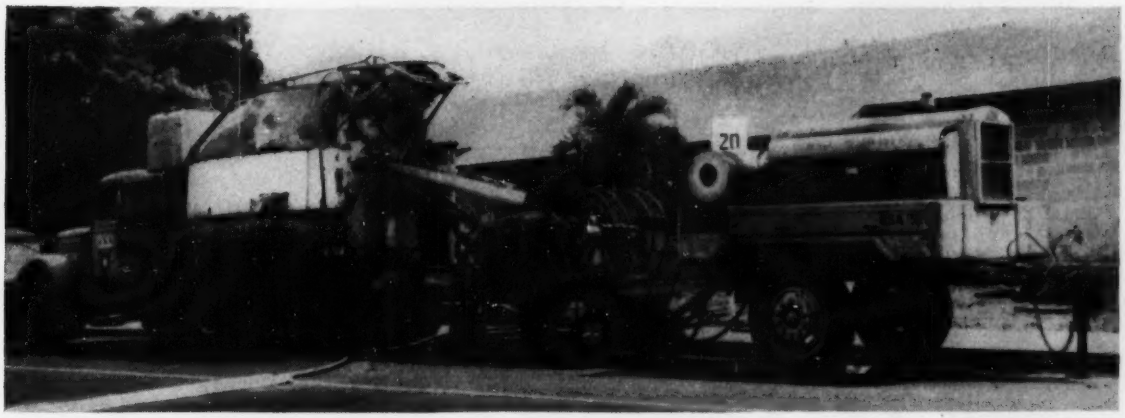


STRAIGHT-LINE PRODUCTION prepares and places cement-mud. Five-yd transit mixer discharges slurry into 20-ft sandblast hopper and Le Roi compressor supplies air at 100 psi to deliver and place material under floor slabs through heavy hose line.

Cement-Mud Raises Concrete Slabs

PRESSURE-PLACED MUD raised 300 sunken concrete floors in Pearl Harbor, Hawaii, Naval Base Housing Areas recently at an average cost of 16c per sq ft.

Following the discovery early last year that so many floors had settled from 1 to 7 in., Public Works personnel of the Navy's Civil Engineering Corps discussed and discarded a number of methods to bring these home floors back to grade permanently.

Two methods of correcting settlement were tried: (1) Pouring a new slab to grade directly on top of the original; and (2) breaking out the old slab, leveling the subgrade with coral and pouring a new slab. Both methods were much too costly, and neither one guaranteed against further settlement.

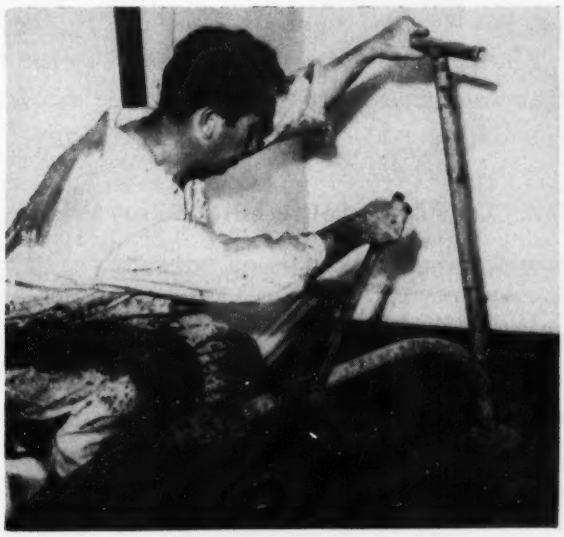
Upon further consideration, it was believed that "mud-jacking" the original slabs to grade might be the solution. But special machinery for this operation was not available at the Pearl Harbor base.

A Gunite machine was tried out to pump material under the first floor selected for a trial raising. First, a thin slurry of top soil mixed with water was prepared in a 6-cu ft concrete mixer. This mixture was forced under the floor slab by the Gunite machine through holes on 5½-ft centers.

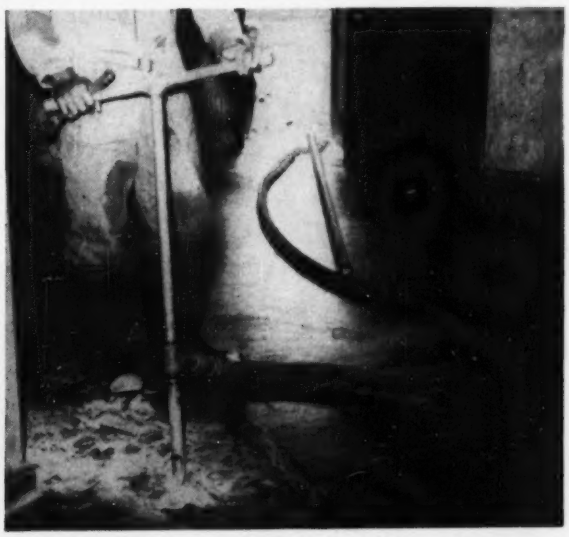
First difficulty was with the earth used in the slurry. Although top soil in that area is composed largely of silt, the small percentage of rock that passed the ¼-in. screen was enough to clog the machine and the discharge nozzle.

Nevertheless, raising of the first floor was a success. But inexperience and lack of proper equipment ran the cost up to $546.52. This figure did not compare favorably with the $325 cost for breaking out a slab and pouring a new one. The experiences with the trial

(Continued on page 106)



NOZZLE on end of delivery line fits into holes drilled on 5½-ft centers. Mud flow is controlled by quick-acting valve. Shrinkage is about ⅛ in. for a 3-in. layer of mud.



WATER NOZZLE inserted through holes in floor slab washes out high points of remaining fill, allows slab to settle evenly before introducing stabilizing mud to bring it to grade.

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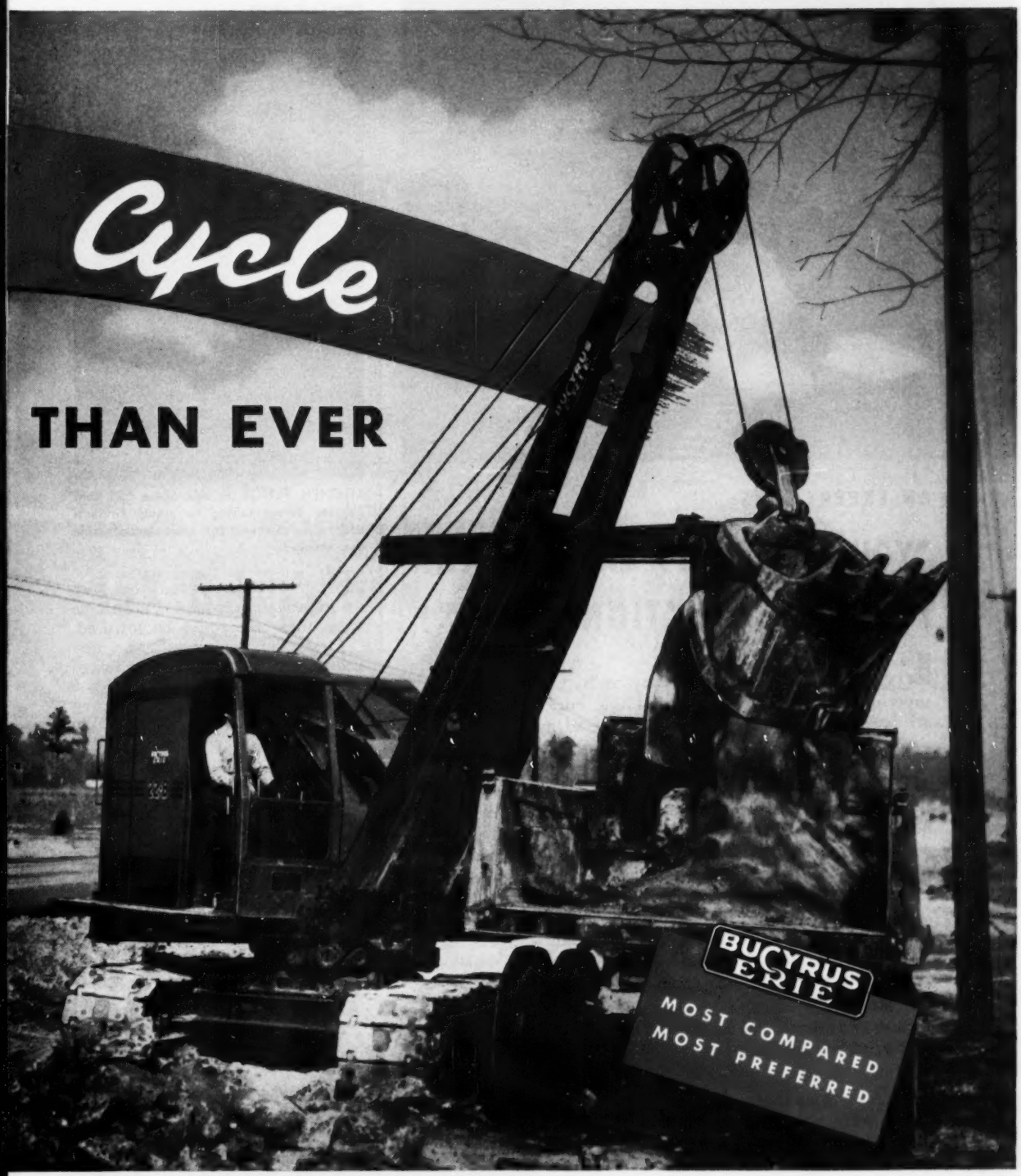
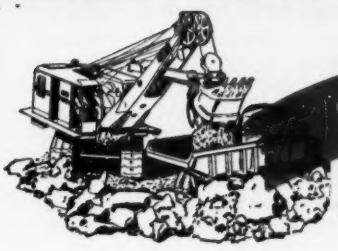
Preventive Maintenance is just one of many important topics covered in a new 32-page booklet — "How to Make Your Excavator Work Harder — Last Longer." It's also loaded with valuable hints on lubrication, adjustments, engine care, safety and many other phases of excavator care. Write for your copy now!





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LAYING PIPELINE is an old story to B. C. Hall, spread superintendent, River Construction Co., Fort Worth. Like all experienced construction men, Mr. Hall makes sure he has the equipment needed to do the job profitably. Mr. Hall's spread kicked off recently with a triple crossing of the Trinity River, near Goodrich, Texas. The river, where pipe crosses, is 260 feet, edge to edge, with swift current and quicksand conditions. For dredging the ditch, one tractor-mounted Carco winch was used to anchor and keep tight the pullback line for the dredge . . . another tractor-mounted Carco winch controlled the stabilizer line. Over-all time, including rigging time, to pull the first pipe across was two hours. One tractor-mounted Carco winch pulled a 450-foot, 20-inch pipe section, weighing approximately 110,000 pounds, across this 260-foot river in 30 minutes.

Mr. Hall, speaking from firsthand knowledge, says, "on construction work you can't beat a Carco winch for efficiency, power and long life."

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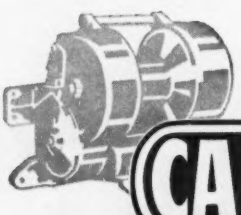
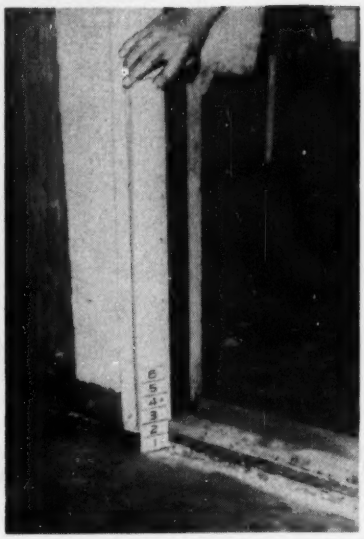


WINCHES FOR ALL INDUSTRIAL TRACTORS

CARCO

CEMENT-MUD . . .
Continued from p. 103



KITCHEN FLOOR in this house had sunk 1½ in. Before raising to grade, cabinets had to be removed and condition of drain line checked.

floor, however, pointed the way to improvements and indications were that cost could be lowered.

First, the equipment was improved. The feed wheel was removed from the lower chamber of the Gunite machine. Slurry then was forced directly into the discharge hose with air at 100 psi, to reduce clogging.

A 5-yd transit mixer replaced the 6-ft mixer and a sand-blast hopper of 20-ft capacity was mounted on the Gunite unit for increased capacity.

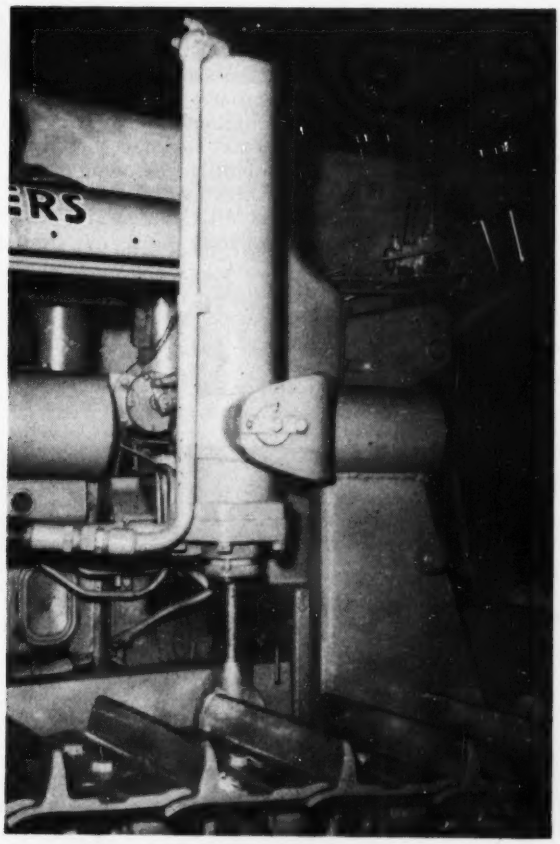
After further experience, the Gunite machine, still given to clogging, was replaced with a double-action piston pump to place the slurry. Clogging at the discharge nozzle was practically eliminated by increasing the nozzle diameter to that of the hose.

Strengthening of subgrade under the slabs being raised was brought about by adding 10% portland cement by volume to the mud slurry.

Costs came down steadily as equipment was improved and operators accumulated experience. In figuring all costs—materials, labor and equipment—the expense of raising sunken floor slabs has averaged 16c per sq ft, as compared with 65c per sq ft for removing the old slab and pouring a new one. The difference in cost between "mud-jacking" and earlier methods approximates a saving of about $70,000 on the entire project.

Allis-Chalmers HD-15 bites into a tough rock removal job with its...

15X–Baker's New, Husky No-Pushbeam Bulldozer



HEART OF THE 15X is a pair of hydraulic cylinders capable of exerting 24,000-lb pressure to raise or lower the integral unit through 55 in.; 39½ in. above ground and 15½ in. below.

By JAMES M. CONNOLLY, Equipment Editor

FOLLOWING the successful development and acceptance of the 9X no-pushbeam bulldozer (CM&E, Nov. 1951, p 107), The Baker Manufacturing Co. is now making a bigger model, the 15X, mounted on an Allis-Chalmers HD-15.

The 109-hp 15X, like its smaller brother the 9X, is of highway width—8 ft—so that contractors can have (1) plenty of horsepower per lineal inch along the dozer-blade cutting edge, (2) stable center of gravity for excellent drawbar pull with the blade in any position and (3) portability usually only connected with smaller rigs for quick over-the-road moves on a trailer without the special permits demanded by most states.

The difference in blade width is made up in its height. It's 51 in. high, so that the net square foot blade area and yardage capacity is only slightly less than the more conventional bulldozer blade.

Main spring and spring pads have been removed and the entire front tractor frame, along with its integrally bolted dozer attachment, is supported by twin hydraulic cylinders. These are 5½-in. dia, and are the same type used on standard Baker bulldozers for the HD-20.

They exert a pressure of 24,000 lb to lift the tractor-dozer unit to a maximum height of 39½ in. or lower it to a digging depth 15½ in. below ground. The mounting-lifting mechanism has not only permitted elimination of conventional pushbeams, but a good deal of weight as well. The unit weighs only 5,366 lb, a saving of almost 1,400 lb.

Classified as the most powerful no-pushbeam highway-width bulldozer, the 15X has stabilizer bars

HEAD-ON VIEW shows clearance with front spring and pads removed. Blade is 96 in. wide to permit over-the-road haul on trailer without special permits. Moldboard height is 51 in.

RADIATOR GUARDS open up for quick access to front-mounted hydraulic pump. Note how oil reservoir tank fits snugly around standard radiator, and close mounting of blade to tractor.

connected to the hydraulic pistons and running from track to moldboard. These absorb torsional strain and reduce horizontal forces on the tractor frame. The protective radiator cover is in the form of two doors, which hinge back to expose a front-mounted hydraulic pump for easy access.

Regardless of blade position, the 15X maintains a center of gravity that allows it to be used for drawbar work with the blade in place, without undue wear on the front-end truck bearings—and providing excellent traction under all conditions.

To remove the blade, no special tools are needed. Stabilizer bars, instead of being outside the tracks like pushbeams, are inside the tracks. The blade is mounted closer to the radiator.

Full applied pressure to the lower piston faces forces the blade to its 15½-in. digging depth, lifting the front end of the crawler tracks off the ground. Thus the combined weight of tractor, blade and tracks increases digging pressure. Both tractor and tracks pivot on the rear axles.

Pressure applied to upper piston faces, on the other hand, extends the jacks until the blade bottom is 39½ in. off the ground. This height, along with removal of main spring and pads, gives the machine unusually high clearance. For similar rear clearance, the drawbar is readily removable.

The supporting hydraulic cylinders compensate for variations in track elevations, doubling normal track oscillation and providing better traction in uneven or soft-surface conditions. Complete details, specifications and performance characteristics of the 15X may be obtained from the Baker Manufacturing Co., Allis-Chalmers Manufacturing Co., or from any of their distributors.

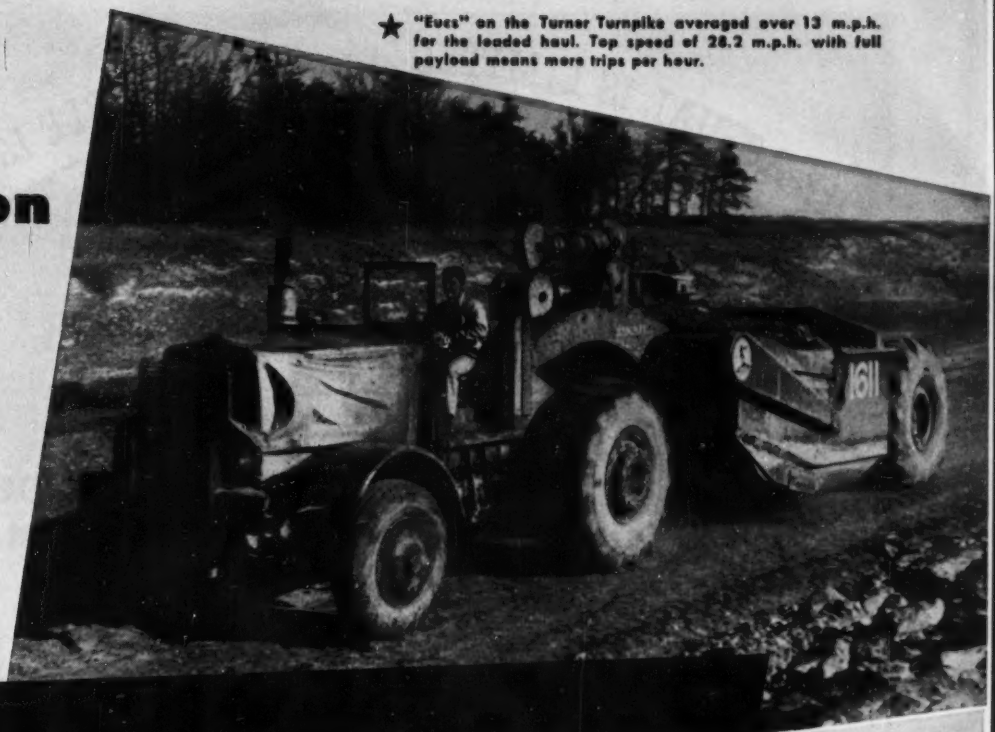
SPECIFICATIONS

Baker Model	*15X Bulldozer*
Tractor Model	HD-15
Approximate Weight	5,366 Lb
Over-all Length Incl. Tractor	191 In.
Moldboard Length	96 In.
Moldboard Height	51 In.
Cutting Edge	⅞x8 In.
Lift Above Ground	39½ In.
Drop Below Ground	15½ In.
Recommended Maximum Track Shoe	20 In.
Cylinder Size	6x26 In.

Rolling Robins

CONSTRUCTION OPERATIONS so fascinated this mother robin that she built her nest on the bedsill of a truck belonging to Beyland & Bennett, Inc., of Little Silver, N. J., so she could ride around their Clinton, N. J., sewage plant job and raise a family of four at the same time. The truck was in daily use on the job and made occasional trips to town all through the bird family's incubation and fledgling stages. In sending this picture to us, C. P. Beyland says the only concession to motherhood the contractors made was to park the truck in the same place every night.

high production on Turner Turnpike with...



★ "Eucs" on the Turner Turnpike averaged over 13 m.p.h. for the loaded haul. Top speed of 28.2 m.p.h. with full payload means more trips per hour.

Euclid SCRAPERS

On a section of the new Turner Turnpike between Tulsa and Oklahoma City, Amis Construction Co. had a really tough job for scrapers—hard clay and sand rock.

Despite the difficult digging, three "Eucs" of 15.5 cu. yd. struck capacity averaged 375 bank yards per hour on a round trip of 3,020 feet, enabling the contractor to complete this work ahead of schedule.

Easy loading, high travel speed, and fast dumping here proved what contractors have learned on many other earth moving projects —that for day-in and day-out performance you can't beat Euclid Scrapers.

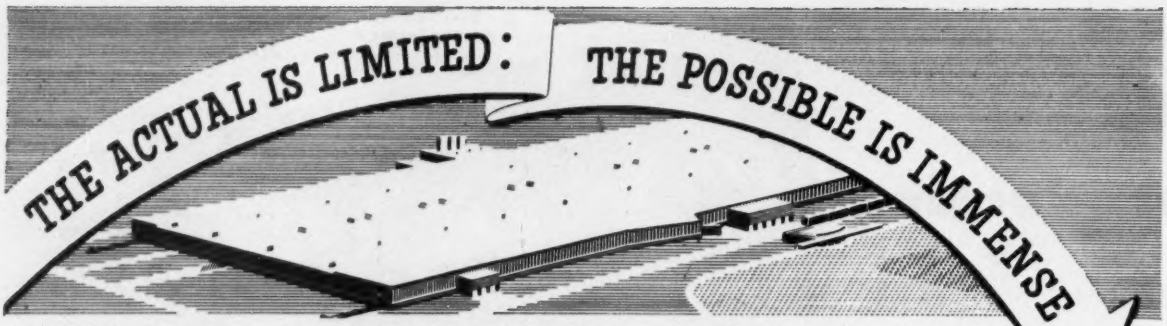
Your Euclid distributor may be able to show you how Euclid equipment can step up production and lower costs on off-the-highway moving of earth, ore, rock and coal. Have him show you performance figures on work similar to yours.

★ Positive, fast acting hydraulic controls permit spreading the load in thin, even layers. Roll-out ejector dumps all types of material fast and clean.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

CABLE ADDRESS: YUKLID CODE: BENTLEY

EUCLIDS *Move the Earth*



NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

© LE Co. 1953

WELDED DESIGN CUTS WEIGHT AND COST OF 12 TON ORE BRIDGE

By **B. A. ROSE,** Director of Engineering
Heyl & Patterson, Inc., Pittsburgh, Pa.

THE many advantages in lower cost, less steel, ease of maintenance and simpler details have prompted maximum use of welded design on this 12-ton ore and coal handling bridge. The result is a span approximately 50% welded. 28 cross frame sections are prefabricated by shop welding, marking a sharp break with tradition in the design and erection of a structure of this type.

The bridge trusses comprise 16 panels, framed by 17 cross frames, fourteen of which are shop welded manually and at low cost in fixtures to hold alignment. Use of wide flange beams for top and bottom chords, top cross members and some diagonal bracing saves the need for complicated built-up structural sections and improves overall reliability.

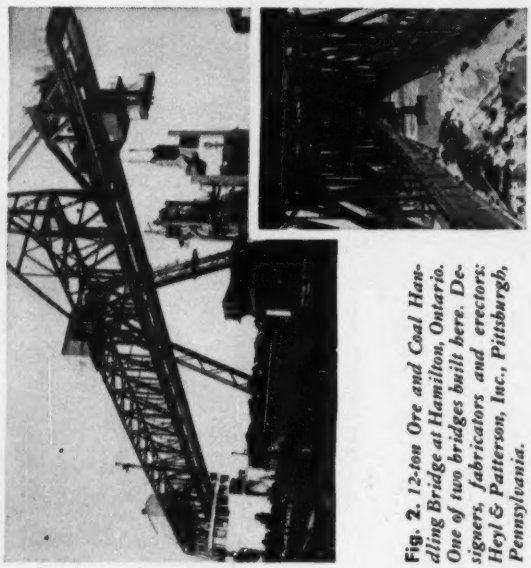


Fig. 2. *12-ton Ore and Coal Handling Bridge at Hamilton, Ontario. One of two bridges built here. Designers, fabricators and erectors: Heyl & Patterson, Inc., Pittsburgh, Pennsylvania.*

SIMPLIFIES DESIGN...CUTS MAINTENANCE

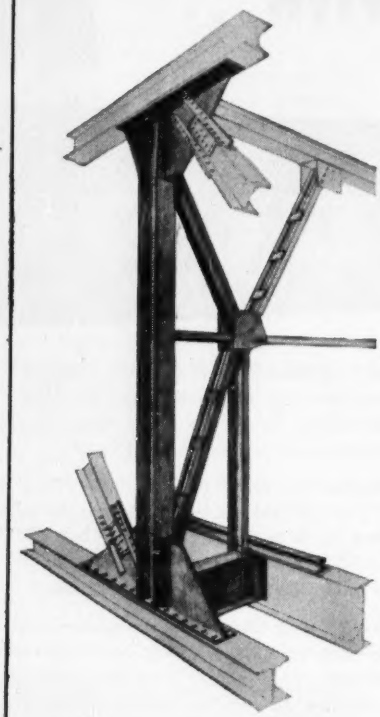


Fig. 1. *Comparison of riveted and welded cross frame connection on coal handling bridge for Dominion Foundries and Steel Ltd., Hamilton, Ontario. Clean design prevents usual accumulation of dust and corrosion . . . helps reduce cost of painting.*

NEWEST ORE BRIDGE IS 50% WELDED

Studies in Structural Arc Welding free on request. Designers and engineers write on your letterhead to Dept. 2701

THE LINCOLN ELECTRIC COMPANY

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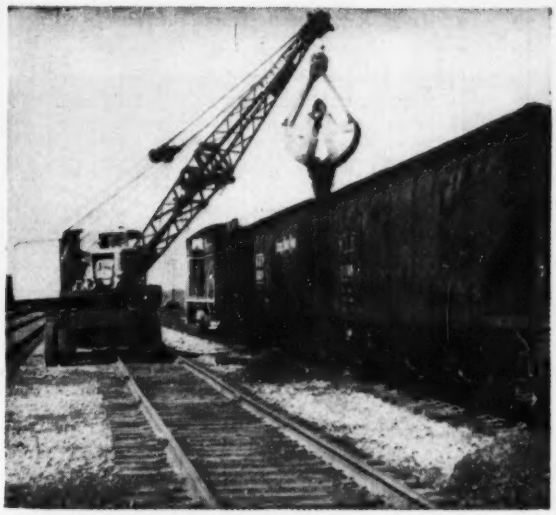
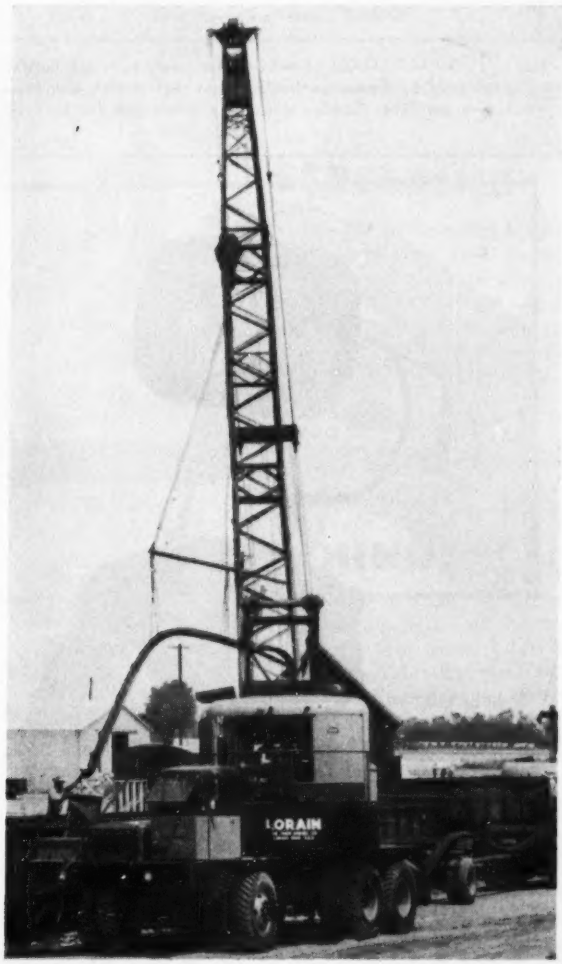
THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT



WORKING ON THE RAILROAD—30-ton Lorain on a three-axle carrier cleans up along the right-of-way with clamshell and dumps into hopper car. Auxiliary engine is used to power a magnet.

BUSY HANDYMAN—Lorain TL-10 clams out a hole on a building site. It's a 6-tonner designed for field mounting on a truck, pier, barge, bin, trailer, flatcar, or what have you.



DUAL FRONT WHEELS—This big and tough Moto-Crane has a capacity of 45 tons. Here it is handling bundles of big reinforcing steel. Dual wheels on front axles rotate independently.

Thew Adds Two Lorains

ADDITIONAL SELECTION in crane capacity has been added to the Lorain line of rubber-tired machines. First, a new 30-tonner is available in both the Moto-Crane and Self-Propelled models, labeled MC-524 and SP-524 respectively.

The Moto-Crane model has an automotive type 3-axle carrier with 10 forward and 2 reverse speeds. Carrier is available in either 6x4 or 6x6 drives, and the rig is convertible to crane, dragline, clamshell, backhoe or shovel. As a shovel it's rated in the 1-cu yd class.

The SP-524 has the same basic turntable on the same 3-axle carrier, but is propelled by the turntable engine at speeds up to 7½ mph. It has four speeds in each direction, drives by rear axles only (6x4).

Each type has air brakes, air-assist steering and can be powered either by diesel or gasoline engine. The boom can be extended to 100 ft with a 25-ft tip extension and has a floating harness that permits 8-part reeving of boom hoist cable.

Also new is Lorain Model TL-10, a 6-ton truck crane with a complete superstructure equipped as a lifting crane and interchangeable to ⅜-yd clamshell or dragline work. It's designed for field mounting on an owner's truck, but is also mountable on piers, barges, docks, trailers and flatcars. The TL-10 is a two-drum, gasoline-powered rig with a 2-piece, butt-flange 25-ft boom. Center sections can extend this to 45 ft. Power boom lowering is optional.

Pictured at left (but not entirely new) is the Lorain MC-824, a 45-ton Moto-Crane with dual front wheels. Axles for the front duals are made by Timken, but Thew manufactures the differential hubs under license from the Differential Hub Co. These hubs allow the inner and outer wheels to rotate independently, preventing the scrubbing on one tire or the other that occurs when they are rigidly connected. These dual wheels also can be used on the SP-414 Self-Propelled crane and on the MC-524 Moto-Crane.

It's Not the Fall...

...It's the Sudden Stop

By W. E. ROSSNAGEL, Safety Engineer
Consolidated Edison System

THE OBJECT of this article is to demonstrate the results when a falling person, or any object, stops too suddenly. Referring to our dust-covered physics book, we find the formula for a free falling body.

$$V = \sqrt{2gH}$$

where V = velocity in feet per second
g = acceleration due to gravity, approx. 32.16
H = height of fall in feet

Simplifying this formula, we find that the velocity in feet per second equals approximately 8 times the square root of the distance fallen in feet. Hence, a body falling freely (wind resistance neglected) for 100 ft would have a theoretical velocity of $8 \times \sqrt{100} =$ 80 ft per sec. Keep in mind that 88 ft per sec equals a mile per minute.

Now let's see what happens when a body falling at this velocity is suddenly stopped. We shall assume that it is a nearly spherical rock weighing 200 lb. In falling 100 ft, this rock develops a kinetic energy

(Continued on page 114)

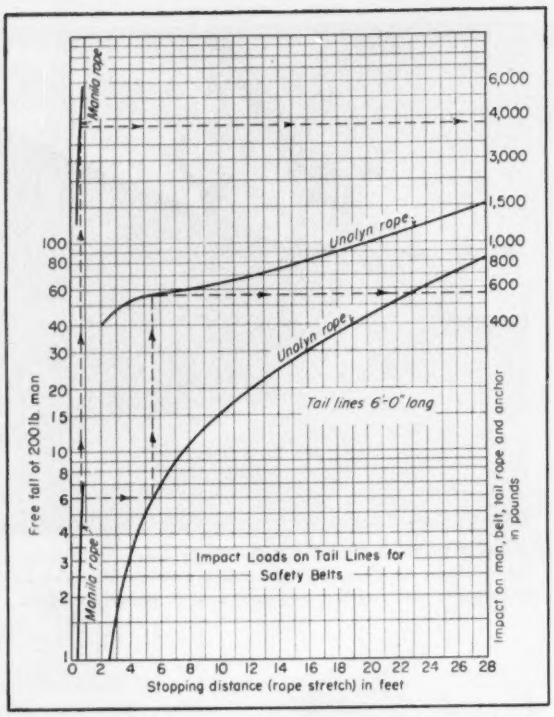

Manila rope
Unolyn rope
Unolyn rope
Tail lines 6'-0" long
Impact Loads on Tail Lines for Safety Belts
Manila rope
Free fall of 200 lb man
Impact on man, belt, tail rope and anchor in pounds
Stopping distance (rope stretch) in feet
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28
100 80 60 40 30 20 15 10 8 6 4 3 2 1
6,000 4,000 3,000 1,500 1,000 800 600 400

Fig. 1 . . . IMPACT LOADS on tail lines for safety belts are illustrated graphically by figures contrasting lines that stretch with those which give but little. Sudden stops by a safety line can be fatal.

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Take for example, the coil that goes into a Wico XHD Heavy-Duty Magneto. It's surge wound with bigger wire and thicker insulation in the outside secondary where electrical strain is most severe. The coil first gets a thorough varnish impregnation and baking. Then a solid block of insulation is molded around the whole coil. This tough, moistureproof jacket protects wires indefinitely . . . prevents breakdown under the exposure to rain, dampness and hard usage that construction equipment must endure.

Heavy-duty coils are only one of the many quality features that Wico has built into more than 7 million magnetos . . . features that assure you dependable ignition in even the toughest field service.

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Big savings on concrete jobs begin when Whiteman Power Buggies are used for placing. These willing workers actually do the work of six men with hand buggies. They scoot over light scaffolds at 16 mph, up 25% grades, over soft earth. They're gluttons for work, never get tired. Priced so low, can pay for themselves on just one job!

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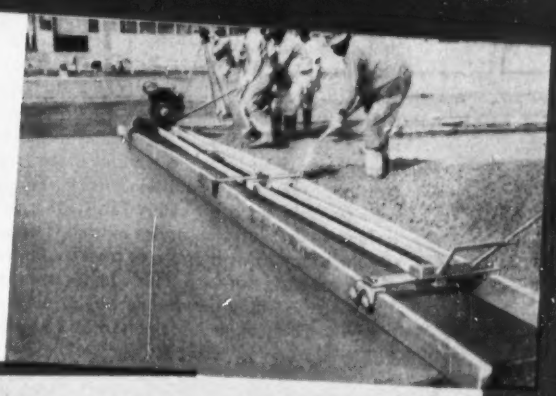
More savings with Whiteman Screeding Machines. Much faster than hand screeding, with half the manpower. Do a better job, too. Vibrate concrete throughout entire depth and area, compact slab, bring moisture to surface, screed to a perfect level. Heavier aggregates remain in suspension making a far more durable slab. Adjustable width.



3 FINISHING

Final savings come with Whiteman Floating-Finishing Machines. One man can do the work of six hand trowels and do it much better. Exclusive "snap-on" float trowels adapt machine in minutes for floating. Tool steel finishing trowels. Trowel pitch easily adjustable with machine in motion . . . a Whiteman exclusive. 3 models.

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of 100 ft x 200 lb = 20,000 ft-lb, which must be absorbed by some material or object when deceleration takes place.

Resting on the ground, the rock exerts a downward force of (it weighs) 200 lb, to which must be added the decelerating force. If the rock lands on hard ground and the impact makes a depression 1 ft deep, it would require a retarding force of $\frac{20{,}000 \text{ ft-lb}}{1 \text{ ft}}$ or 20,000 lb to absorb the kinetic energy of 20,000 ft-lb in a 1-ft stopping distance, to which must be added 200 lb for the weight of the rock.

If the depression were 2 ft deep, the force would be $\frac{20{,}000}{2}$ = 10,000 lb, plus 200 lb for weight.

If the rock lands on concrete pavement which deflected ½ in., and the rock itself compressed ½ in., or a total of 1 in., the retarding impact would, theoretically, be $\frac{20{,}000 \text{ ft-lb}}{1/12 \text{ ft}}$ = 240,000 lb, plus the 200 lb. Yes, that is a terrific wallop.

The retarding force will be somewhat less than indicated in these calculations when a human being falls and strikes the ground or other immovable object. A body compresses under impact more than a rock due to the position in which it falls and the retarding effect of the safety belt, if one is worn. Also, it may be possible that arms and legs will travel a slight distance farther than the torso. For instance, a man wearing a life belt may fall with his body in a prone position. When the rope tied to his safety belt becomes taut and deceleration begins, his abdomen may be compressed considerably. Also, his body may bend like an inverted V, his head, arms and legs traveling, perhaps, a foot farther.

Keep it Short

All men working on scaffolds or at elevated locations should be equipped with safety belts to restrict their falls. And the safety belt should be secured by a rope to some anchorage which, together with the belt and the rope, should be strong enough to resist the retarding force developed when the man's fall is arrested.

In order to keep to a minimum the free falling distance the tail rope on the safety belt should be as short as possible without unnecessarily restricting the movements of the workman. And the anchorage for the tail rope should never be lower than the man's waist.

Wearing a life belt can give a false sense of security, as the author once observed. A painter was working on a 90-ft high ceiling of the turbine room in a large power plant. The roof was supported by steel trusses about 12 ft deep. Just below the trusses was the runway for a large traveling crane. To reach the ceiling a ladder was placed with its lower end against the rail on one of the crane girders, and its upper end resting against, and lashed to, the upper chord of one of the trusses. The painter, wearing his safety belt, was standing near the top of the ladder and he had the tail rope securely anchored, of all places, to the handrail on the bridge walkway about a foot below the bottom of the ladder, some 20 ft below him. If he had fallen, the tail rope would have failed after a drop of about 40 ft, the man would have landed with only slightly less impact than if he had not had the life belt on

(Continued on page 118)

THE BIG 3

in the LeBus lineup of top flight tools for the truckers are LeBus Truckers Special SNATCH BLOCKS, LeBus "Bull Dog" LOAD BINDERS, and LeBUS TAIL CHAINS. For safety . . . security . . . and dependability . . . make sure your equipment is equipped with the Big 3. These tools are completely drop-forged of quality steel and are heat-treated for strength and dependability in service. Your costs can be lowered considerably since all LeBus Tools are guaranteed against any defects and failures in service made in line with the recommended specifications. This alone can save you many dollars since much of the breakage of such tools are not always the fault of the user. Think of the many down-time hours saved when using LeBus all the way. *For further information on the Big 3, write for catalog pages #100, #450, and #1000.*

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Operation "Big Ditch"

Results obtained by the hard-working R. B. Potashnick Construction Company show benefits you can get with . . .

STANOLUBE HD-M
REG. U. S. PAT. OFF.
Motor Oil

The R. B. Potashnick Construction Company, Cape Girardeau, Missouri, is adding further to its great reputation for completing the tough jobs ahead of schedule. This contractor is now working on a vital flood control project which will provide a by-pass for the Arkansas River around Wichita, Kansas. The operating "know-how" of this company has helped move work well ahead of schedule. Important to efficient operation has been the employment of an outstanding safety program and the use of good equipment, powered and protected by high quality petroleum products.

Mr. W. H. Jordan, Superintendent, is shown above (right) with Mr. W. G. Ingraham, Automotive Engineer of Standard's Wichita office. Mr. Jordan knows how to get the most out of his equipment. He has this to say about his experience with STANOLUBE HD-M, Standard's new and better motor oil:

> "We push our equipment hard all the time, and it must be able to take punishment. STANOLUBE HD-M has protected our engines under these conditions to the extent that we have not had an engine failure caused by faulty lubrication. In addition, our engines have stayed clean which has reduced our maintenance costs. Trouble-free operation of our equipment, together with a successful safety program, has helped us keep 20% ahead of schedule on this Wichita, Kansas, flood control job."

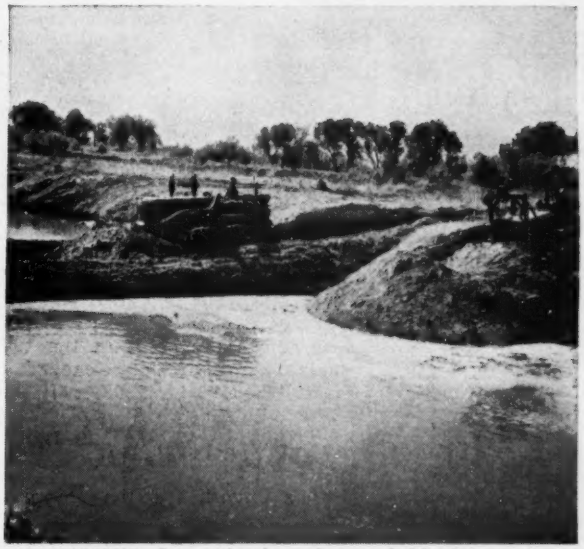
Make the experience of the R. B. Potashnick Company your basis for trying STANOLUBE HD-M Motor Oil. In the Midwest, you'll find a Standard Oil Automotive Engineer located near you. To get his help, phone your local Standard Oil office. Or write, Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY
(Indiana)

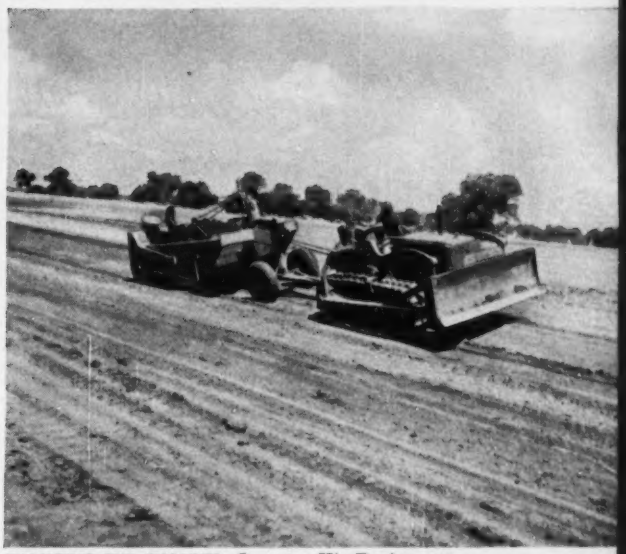
STANDARD

REMAKING A RIVER BED. The channel of the Arkansas River is being realigned by this fleet of International crawlers owned by the C. W. Kelley Transport Company, Inc., and Rush Construction Company, shown cutting new channel through section of island.

Speeds up Sleepy River



RIVER CROSSING. International crawlers reach islands to start re-channeling work by building earth ramps across the river. They worked in sand and water throughout the summer with no downtime.



CHANGING THE CHANNEL. Operator Kie Bayless says: "These TD-14As have more 'soup' than any other tractor their size. They just plain move more dirt."

International crawlers speed up flow of Arkansas River as safeguard for Kansas wheat belt

Flow of the long and lazy Arkansas River is being speeded up one-third along a 30-mile stretch in Reno County as a flood prevention measure aimed at safeguarding the rich wheat belt in this Kansas County.

When the river rises just six feet, and it does periodically, it spills all over the wheat fields and causes extensive damage.

But county officials feel they have a solution. This year they launched the first portion of a proposed three-year plan involving some $50,000 expenditure each year for elimination of bad turns and islands in the river channel. This improvement will increase the flow of the river from 4.06 feet per second to 5.41 feet per second or more and it is felt this faster flow will be sufficient to keep the river in its channel.

Dirt moving for the first-year phase of the improvement is being handled by Rush Construction Company and C. W. Kelley Transport Company, Inc., with rugged red International TD-18A and TD-14A crawlers.

H. M. Dunsworth, job foreman, reports:

"We lug these TD-18As and TD-14As down all the time. They not only have the power and maneuverability to do a bang-up dirt moving job, but that high-speed reverse sure makes us money on this river job as lots of the dozing calls for long pushes. These Internationals, and some have been used for years, have worked over two months here under miserable conditions with absolutely no downtime."

Ask your International Industrial Distributor for details on the whole International line of money-making crawlers. Ask him, too, about his fast, ready service and speedy parts delivery. Get all the answers . . . you'll want International "Power that Pays" from now on!

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POWER THAT PAYS

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Obsoletes All Other Types of Scaffolds

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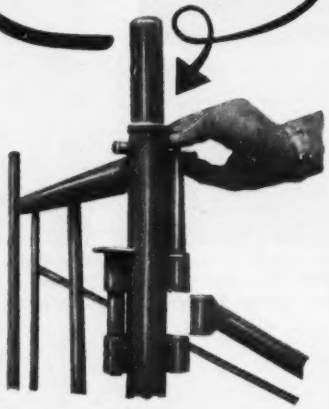

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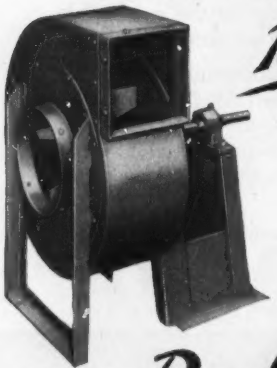
When Construction Problems Involve

AIR HANDLING



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No matter how complex or specialized an air handling requirement may seem, there's a type of BAYLEY Fan equipment that can be readily adapted to meet the situation. Properly designed and selected, these engineered installations will deliver dependable, trouble-free service year in, year out. A fact proven by nationwide recognition of BAYLEY efficiency and economy of installation.

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SUDDEN STOP . . .
Continued from page 114

and, undoubtedly, would have been killed instantly.

To get down to some practical and safe conditions, assume that a 200-lb man is at work at an elevated location. He wears a safety belt with a ¾-in., 6-ft long manila rope tail line anchored to a rigid support at waist height. If he accidentally stepped off, he could fall 6 ft before the slack in the tail rope took up. The kinetic energy of his fall would be 200lb x 6ft, or 1,200 ft-lb.

Big Stress

Let's investigate the stopping force, and the stopping distance. Referring to *Fig. 1* (*page 112*), enter the chart at the left margin at 6 ft free fall for a 200-lb man, follow to the right to the inclined line for a manila rope, and project to the bottom of the chart to read about .8-ft stretch of the rope. Also, from the intersection of the horizontal and inclined lines, follow upward to the other inclined line, and then horizontally to the right margin to read about 3,700 lb—total strain on the man's abdomen and on the life belt, manila tail rope and anchorage.

This is a terrific impact on a man's body, and may result in broken ribs, spinal injuries or harm to internal organs. With a brand-new manila rope having spliced eyes or knotted attachments, the breaking strength may be only in the neighborhood of 4,800 lb, or it has a safety factor of about 1.3. If an old, worn or dried out rope is used, maybe it won't take it.

If the manila rope tail line is attached to a hanging life line, say 30 ft long, from the tail rope attachment to the anchorage at the building roof, then the length of the rope which will absorb the impact will be six times as long, and the impact on the man's body will be much less.

But a word of warning. Did you ever notice that on many construction jobs rope which is considered badly worn and unsafe for hoisting purposes is often used for life lines? Don't do it! Use only the best rope obtainable for the hanging life line.

Is there some other rope material which will stretch more than manila, and hence be more desirable for use with safety belts? How about nylon rope? This stretches about twice as much as manila, and the same diameter has three to

four times the strength. Hence, it should be a big improvement over manila.

Also on the market today is a new ¾-in. rope called "Unolyn" and made of unstretched nylon fibers coated with a microscopic film of neoprene before laying up into the strands. Unolyn has the property of stretching to five or six times its original length (after which it is known as nylon), although its strength is not so great as that of manila fiber. Although a Unolyn ¾-in. tail rope 6 ft long has only about 30% of the strength of a similar manila rope, it will

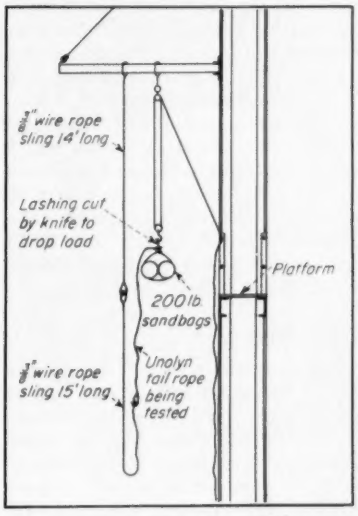
⅞" wire rope sling 14' long
Lashing cut by knife to drop load
Platform
200 lb. sandbags
Unolyn tail rope being tested
⅞" wire rope sling 15' long

Fig. 2 . . . Drop test subjected 200-lb load to a free fall of 9 ft 2 in. Unolyn tail rope stretched 2 ft 10 in., gave rebound of 1 ft.

safely absorb 16 times more kinetic energy of a falling man than will a manila rope.

The Unolyn ropes used by the author for test purposes were purchased from the Rose Manufacturing Co. of Denver, manufacturers of safety belts and allied equipment. The working length of the standard tail rope is 6 ft, or slightly longer. Some ropes tested had 18-in. lengths at the ends which were pre-stretched and reduced to ½-in. diameter to facilitate tying to the D ring on the safety belt and to the anchorage or to the hanging life line. Other tail ropes have eye splices at both ends. The former type is preferable.

Drop tests and laboratory tests were conducted by the author upon a number of tail ropes. In the drop tests two 100-lb sand bags were tied to one end of the Unolyn tail rope, which, in turn, was secured

(Continued on next page)

Busting a Bronco!

LESS Bounce
..NO Jounce
with a GREER ACCUMULATOR

Hydraulically operated bucket loaders and power shovels can operate as smoothly and efficiently as a well-trained horse instead of like a wild bronco by simply installing a Greer Accumulator.

A Greer Accumulator eliminates shock and vibration that weaken the structure, damage hydraulic components, fatigue the operator, and reduce speed of operation, especially on difficult jobs. Tests conducted with Greer Accumulators by a well-known bucket loader manufacturer showed amazing improvements in operation. Let us help you with your hydraulic shock problems. Write or phone.

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   a. Leakage compensation.
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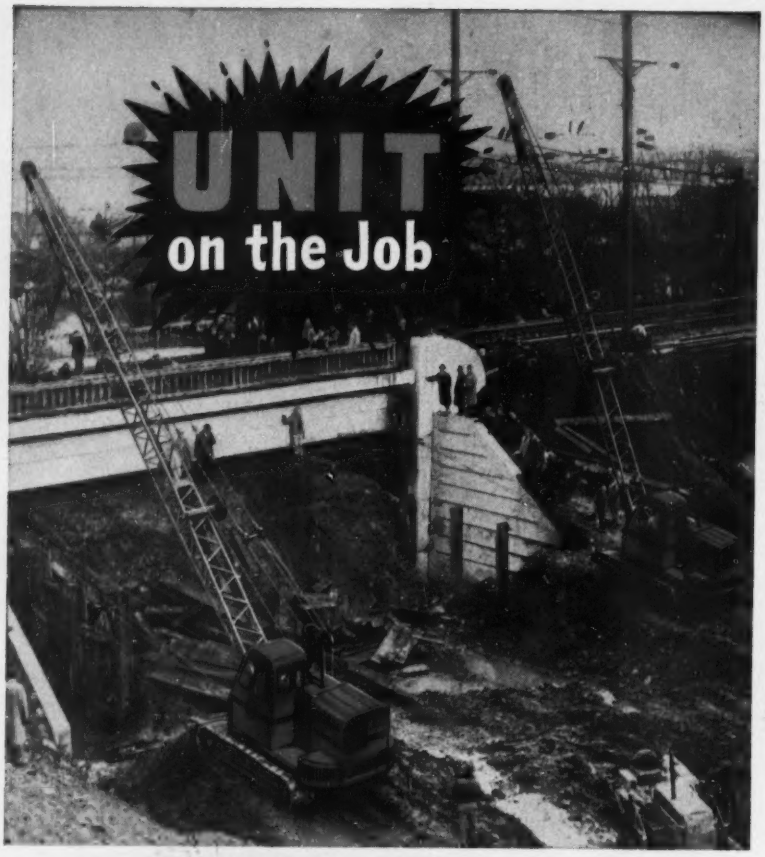

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Working as a team, these two UNIT 1020 Cranes moved a 500 TON railroad bridge from its temporary mounting to the new structure in a period of thirteen (13) minutes. This type of job calls for smooth and accurate control of boom and hoist line operation. UNIT'S extra long crawlers, multiple-hinged shoes, wide axles, and hook rollers provide perfect balance and stability. This, together with the FULL VISION CAB for complete visibility, makes UNIT the machine that is dependable and safe to handle efficiently any type of heavy-duty work.

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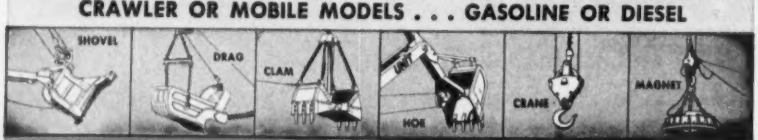

All Models Convertible to ALL Attachments!

SUDDEN STOP . . . Continued

to a ⅜-in. wire rope sling suspended from a jib crane on the superstructure of a large gas holder (see *Fig. 2* page 119). By means of a set of manila rope falls the load was hoisted to the desired height. The lashing on the hook was cut with a knife, and the load had a free fall of about 9 ft 2 in. As nearly as could be determined by a visual observation, the rebound was about 1 ft. A subsequent measurement indicated a stretch of approximately 2 ft 10 in. under the 200-lb static load.

The drop test was repeated on the same rope, this time the 200-lb load falling about 27 ft. After a 2½-ft rebound, the stretch under the static load was measured at 6 ft 5 in., over and beyond the 2-ft, 10-in. stretch on the initial test. The total stretch was therefore about 9 ft 3 in., whereas the estimated ultimate stretch should have been about 30 ft. The total kinetic energy absorbed in the two falls was 2,250 ft-lb and 5,400 ft-lb, respectively, or a total of about 7,650 ft-lb.

Put it Anywhere

Let us refer to *Fig. 1*. Again entering the chart at 6-ft free fall of a 200-lb man, we follow horizontally to the curve for Unolyn rope, and projecting down to the bottom margin we read about 5½-ft stretch or stopping distance. Or following upward to the other Unolyn curve and then to the right margin we read 560-lb load on the man's body and on the belt, the tail rope and the anchorage.

It's all in the Rope

Yes, even 560 lb suddenly applied to the mid-section of a man's body is no joking matter, but it is much less painful than the 3,700-lb impact if the manila rope tail line is used. In fact, with a Unolyn rope tail line, 6 ft long, attached to a long hanging manila life line, a man could fall freely for 80 ft and still be stopped with a jerk of less than 1,500 lb—less than half the impact of a 6-ft fall on the manila rope tail line.

If conditions require it, the 6-ft Unolyn rope could be placed between the top of the hanging life line and the anchorage at the building roof. Then the tail line could safely be made of manila rope. It is necessary only to get a 6-ft length of Unolyn rope into the life-line system at the most convenient place.

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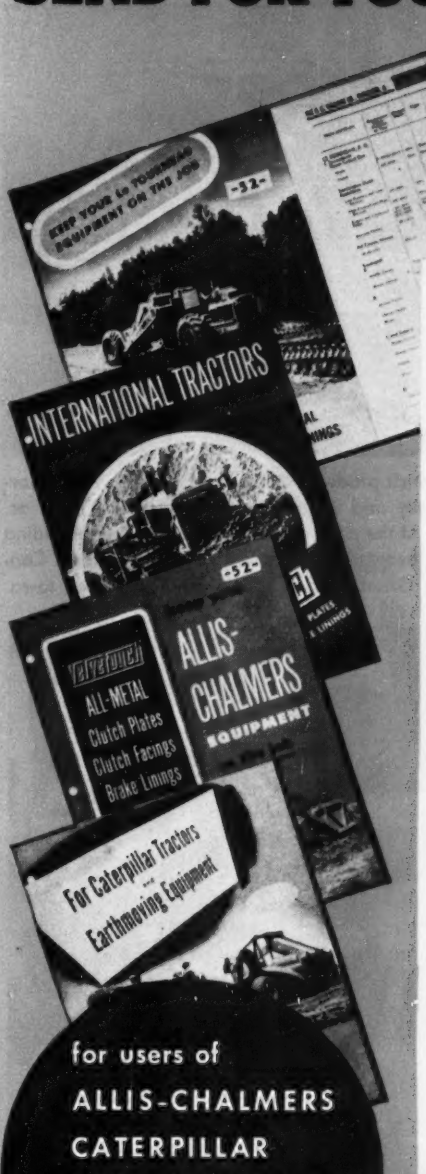

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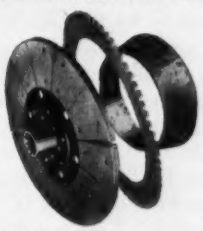

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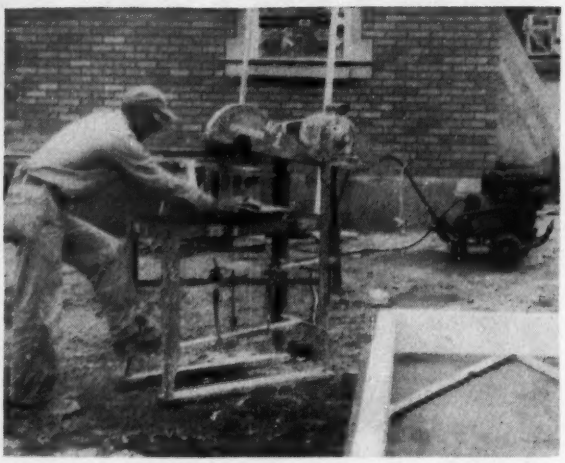
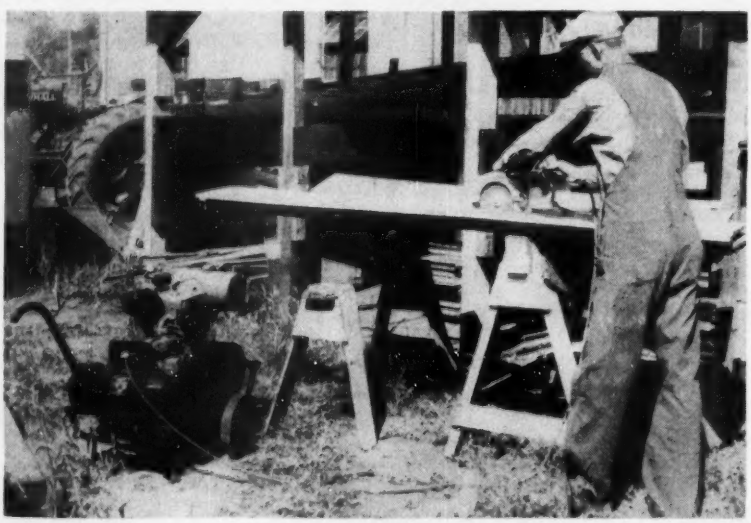
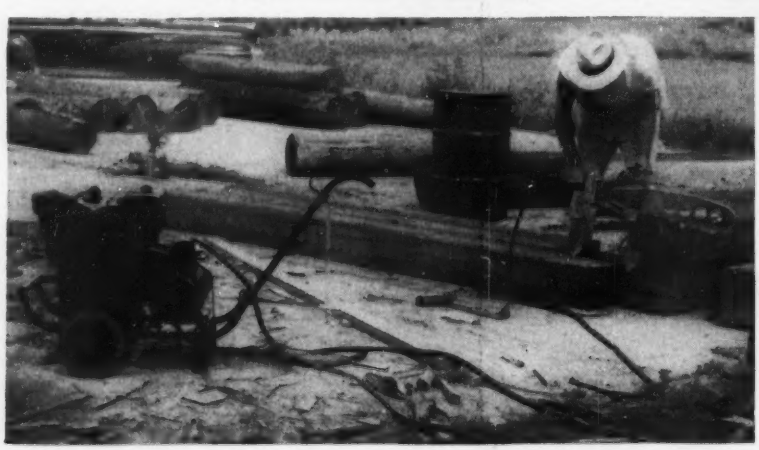


A WORKMAN can easily take electricity with him to any part of a construction job, thanks to Wincharger Corp.'s new line of portable generators. In the photo above left, a Winco 4500 is shown powering a Jackson electric tamper at an undisclosed military project. The 4500 is a general purpose rig which produces 4,500 w (at 100% P.F.) motor-starting capacity and 2,500 w, continuously at 115 v, ac, single phase. At the right above, another 4500 is providing electricity to power a masonry saw for Chris Hansen Construction Co.'s Grant School addition in Sioux City, Iowa.

WINCHARGER CORP. made a thorough study of the requirements of electricity for the host of tools used in the construction business. The data was compiled at the Sioux City, Iowa, plant and resulted in five models in an 1800 series, in addition to the Model 4500 shown above. In this 1800 series, the five models are powered by Briggs & Stratton 8, Clinton D1100, Cushman M6, Lauson TLH or Wisconsin ABN engines. They have wattage outputs of 1,000, 1,250 or 1,350. The company puts both generators and tools through their paces, as shown at right, where a plant workman tests both a generator and a power saw out in the open.



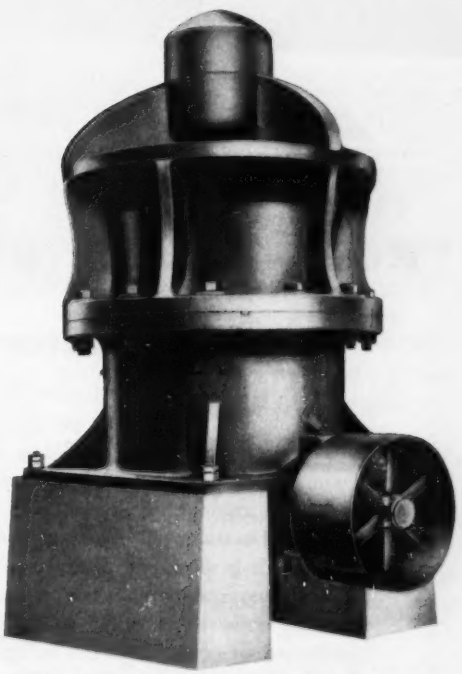


THIS IS THE SAME 4500 Model as that shown in the picture at upper left. Here it's powering an electric chain saw to make short work of removing rough ends from bridge timbers on the same undisclosed military job. The generators have proved particularly useful on out-of-the-way bridge jobs where electricity is usually not available for vibrators, saws, drills, etc., and where it's either impossible or impractical to string wires or install conduit. Handy wheel and handle arrangement is called "Speedy Shift."

Dam the flood of rising costs

Traylor TY Reduction Crusher cuts aggregate costs three ways

The Traylor TY's Curved Concaves and Bell Head lower power costs. Power is applied as a direct crushing force. The eccentric motion of the bell head exerts power directly counter to the curved concaves. This stops lifting and churning of aggregate within the crushing chamber . . . cuts down power loss . . . reduces power costs per ton. Curved crushing surfaces last longer. Each succeeding crushing zone is of greater capacity than the preceeding zone. Aggregate falls freely from one stage of reduction to the next. This reduces choking and packing . . . causes less wear . . . reduces costly downtime and lost production. With less choking or packing . . . no lifting or churning . . . the Traylor TY also reduces the percentage of waste fines. Curved crushing surfaces produce a more uniform cubical aggregate at less cost per ton.



Get all the facts about construction and design advantages of the Traylor TY Crusher. Send for Bulletin 7112 today.

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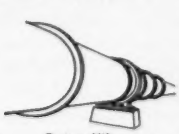
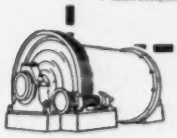
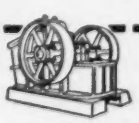


Rotary Kilns

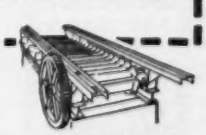
Secondary Gyratory Crushers



Ball Mills



Jaw Crushers



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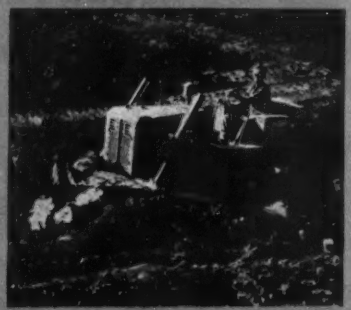

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F-536

On-the-Job Contractor-Labor Relations

by LEON B. KROMER, JR.

As the New Congress Convenes . . .

AND THE FIRST REPUBLICAN administration in 20 years takes over, hearings are planned to start soon aimed at amending the Taft-Hartley Law and determining the future of wage and salary controls.

Barring a future national emergency, it appears that controls will go out either by executive order or when the law dies on April 30, 1953. *Caution*: Remember that enforcement proceedings against violators continue, and termination of controls when it comes will not mean the end of enforcement.

It is certain that there will be amendments to the Taft-Hartley Act, in addition to the one mentioned last month (page 146), which would permit contractors and unions to negotiate an agreement before the start of a project. Another change under consideration would require you, as an employer, to file a non-communist affidavit similar to that now required of union officials.

It is certain that there will be no change in the anti-closed shop provision of the law, even to benefit such industries as construction, that have traditionally hired workers exclusively from the union hiring halls. Attempts may also be made to put the Mediation and Conciliation Service back in the Labor Department, but Congress won't go along. The Service will probably be strengthened and used more than heretofore as an instrument in settling labor disputes.

With Changes Pending . . .

It's not too early for you to start thinking of bargaining negotiations that will get under way this spring. As soon as pay controls are off, wages will become "Item No. 1" on the agenda of union demands. Fringe benefits such as welfare and pension funds will also rank high in union negotiations. Be prepared with sound economic reasons and persuasive arguments, if you don't

(Continued on page 127)

NEW! HEAVY-DUTY BANTAM®

Model T-35

Mounts on special Bantam crane carrier or any std. tandem or heavy-duty single axle truck. Trucks available through factory, or local Bantam Distributors.

6-ton crane still at lowest price in the industry!

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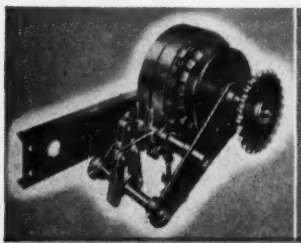
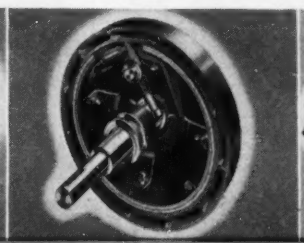


Power Boom Hoist Standard Improved design with increased brake surface and extra bevel pinion let you "inch" loads up or down with precision accuracy.



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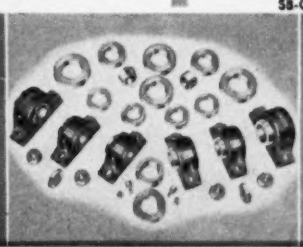

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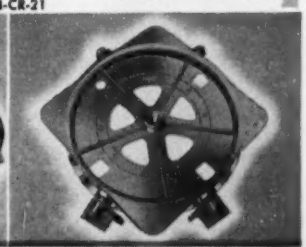
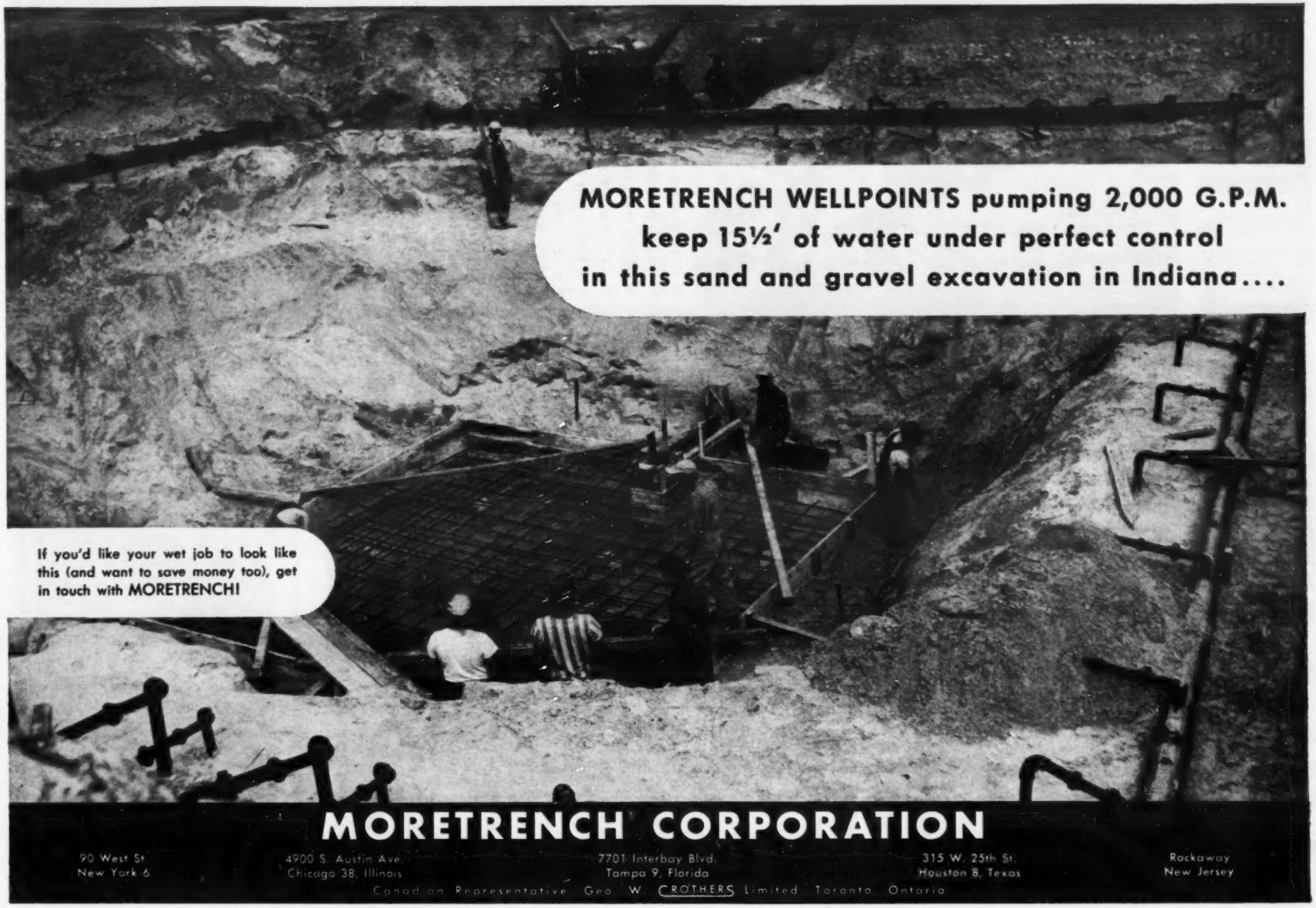


Rugged Turntable Base. Wider 4-point mounting with 4 oversize trunnion rollers and 4 hook rollers give the T-35 extra strength and stability.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LABOR . . . Continued from page 124

want to pay high wages and contributions to funds.

If you are one of a committee of contractors that will negotiate either a new agreement or renewal of an existing agreement, it is wise to get the unions with whom you will bargain to submit in writing provisions they desire to incorporate into an agreement, or a list of changes they desire in the current agreement. You should also submit to the unions the clauses you want included in a new agreement or changes that should be made in an existing agreement. The exchange of contract demands can actually be done at a preliminary meeting before negotiations get under way.

To bargain successfully it is essential that a committee representing contractors become thoroughly familiar with the unions' proposals not only as to cost factors but also for any implications that may alter methods of operation. Too often contractors are inadequately prepared, with the result that they are on the defensive when negotiating. For example, when wage increases are being discussed, the contractor's sole objective is frequently to minimize the amount of increase. Yet, there is no valid reason, particularly in a period of comparative stable living costs, not to take the other tack and compel the unions to justify any increases. The contractors should have, in the meantime, marshalled arguments against wage increases.

The Welfare Trap

The first time union bargaining committees talk welfare funds based on employer contributions, contractors feel trapped. This is often because they are up against something they know very little about; what welfare funds should provide, the machinery of setting up the fund, etc. Yet contractors are not in the insurance business and should not be expected to to know too much about welfare funds. Assuming, therefore, that the contractors' committee agrees in principle to welfare funds, the first step is to insist that the unions join in obtaining the services of an actuarial expert to guide both parties through the miasma of group insurance, medical and surgical benefits, etc. A badly set up welfare program is worse than none and can lead to an infinite number of disputes.

If you are a member of a contractor's negotiating committee,

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The development of Twin-Coaxial Volute Passages, by Carter Engineers, makes possible the greatest pump performance ever attained. Here's a lighter, more streamlined Volute case that offers greater capacity, faster priming and more trash handling ability than ever before.

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A completely different method of impeller adjustment, the easiest you've ever seen . . . no shims, no wear plates, no replacement parts of any kind. This simple adjustment completely compensates for impeller wear, in a matter of minutes . . . without removing impeller, without disconnecting suction or discharge hoses, without dismantling the pump.

☆ *HERE'S THE ULTIMATE IN SIMPLICITY . . .*
Only two basic parts **. . . that's all you'll find inside the new Humdinger. Every other wearing part has been eliminated . . . making this amazing new pump the simplest ever built . . . the easiest to maintain . . . the world's most advanced contractors' pump.**

Here's a Self-priming Centrifugal that's years ahead. The Humdinger is *really new* . . . completely different . . . engineered to give Contractors the finest pumping equipment available.

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you can get a number of pointers from an excellent survey of welfare funds carried out by the Welfare Fund Committee of the Building Trades Employers Association of New York City. The report details the growth, increase in benefits, expenditures and financial status of 27 funds covering about 80,000 building tradesmen. These funds are financed by employer contributions, most 3% of payroll but some as much as 6%, and administered by a joint board of trustees of union and contractor representatives.

This survey report is available and can be obtained by writing to the Association at 2 Park Ave., New York 16, N. Y.

Points to remember in collective bargaining:

1. Know what the unions are looking for before sitting down to bargain.

2. Be prepared with facts and arguments on those provisions you oppose.

3. Present beforehand your own proposals.

4. Be prepared with facts and arguments to support your proposals.

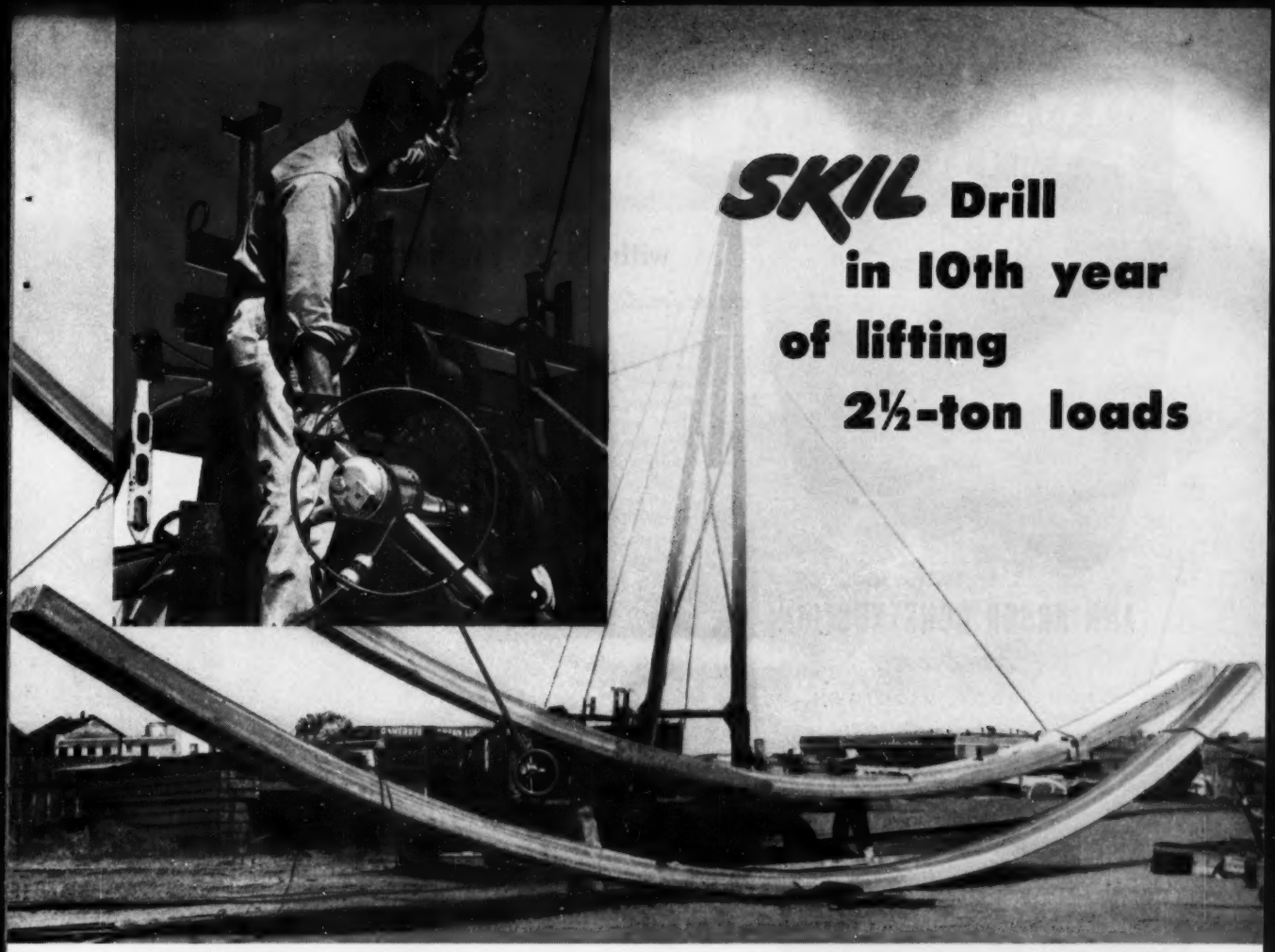
5. Draw up the contract in simple and understandable language.

Caution: Don't permit illegal conditions to be included in the contract. A closed-shop provision is illegal and, in the event that you are faced with an unfair labor practice complaint, it will be used against you.

Do You Know That . . .

Another AFL building trades official moves into the labor Department with the appointment of Lloyd K. Mashburn as Under Secretary of Labor? Mashburn, formerly California Labor Commissioner, was for many years secretary-treasurer of the Los Angeles Building Trades Council and is a member of the lathers' union . . .

Senator H. Alexander Smith of New Jersey takes over as Chairman of the Senate Labor and Public Welfare Committee? Senator Taft remains as a member of this committee, and both Senators will have lots to say about any amendments to the T. H. law.



SKIL Drill in 10th year of lifting 2½-ton loads

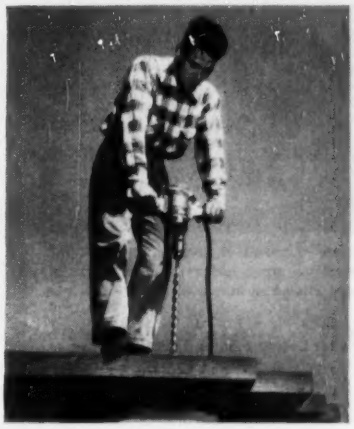
Reasons for standardizing on SKIL Tools told by Timber Structures, Inc. of Cal., Richmond, Cal.

"We have standardized on SKIL Tools for all of our manufacturing and erection work," says Mr. J. A. Finelli, Production Manager of Timber Structures. "The reason is that other makes just don't measure up to SKIL in power and durability. We have proved this in side by side tests.

"Here's the kind of beating we give these tools. Our trusses weigh 2½ tons and more, and power for the winch that lifts them is furnished by a ¾" SKIL Drill that has been doing the job for 10 years.

"As a result of SKIL performance, we have standardized on SKIL Tools and now have an inventory of well over 50, including drills, saws and belt sanders.

"Our SKIL Tools put in an 8-hour day, every day, in our manufacturing, and in addition, each of our trucks carry enough SKIL Tools to equip 3 to 5 men on erection sites."

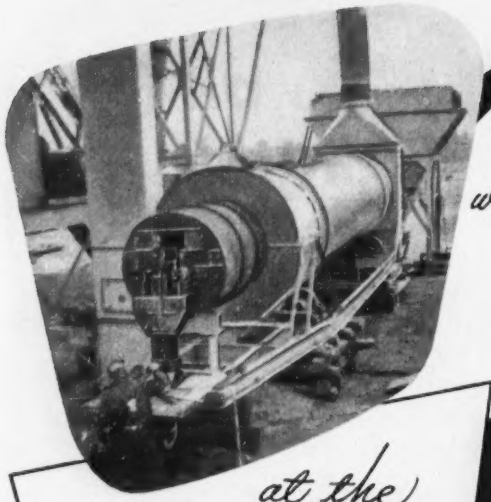


R. L. Eidsvold of Timber Structures uses a model 83 SKIL Drill to bore bolt holes in roof trusses—an 8 hour a day operation. A new drill of another well-known make failed quickly on this job. The 6 year old SKIL Drill is still going strong.

SKIL PORTABLE TOOLS

SKIL Products are made only by
SKIL Corporation
formerly SKILSAW, Inc.
5033 Elston Ave., Chicago 30, Illinois
Factory Branches in 34 Principal Cities

Vern Johnson trims the ends of roof trusses with a model 87 SKIL Saw—another operation that goes on all day at Timber Structures, Inc. to prove the power and durability of SKIL Tools. Full depth of cut is required "and it takes a saw designed for heavy duty to stand this abuse," they say.



"Based On Our Experience with HOPKINS BURNERS we've installed Hopkins Units in our 3 other plants"

If your plant needs an efficient combustion system, consider this message from the Ann Arbor Construction Company. Mr. W. B. Ratliff, Secretary, says—"Our first Hopkins Volcanic Dryer Unit, consisting of three No. 4 Burners, was installed on our No. 4 asphalt plant when it was moved to Roscommon, Michigan, for a 21,000-ton bituminous concrete paving job.

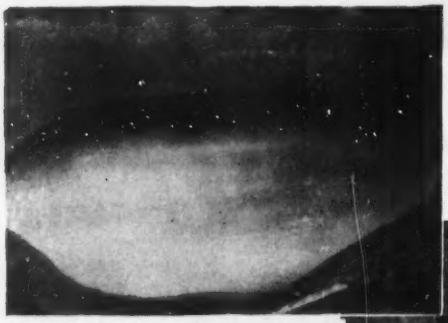
"Based on our experience, using Hopkins Burners on our No. 4 plant, we have installed Hopkins Equipment on each of our three other plants. The four plants have produced over 90,000 tons of bituminous concrete so far this season without any trouble, and without any complaint of moisture in the mix."

You, too, can benefit from Hopkins' efficient, low-cost operation. A letter or phone call will bring you descriptive literature and complete details.

at the ANN ARBOR CONSTRUCTION Company
ANN ARBOR, MICHIGAN

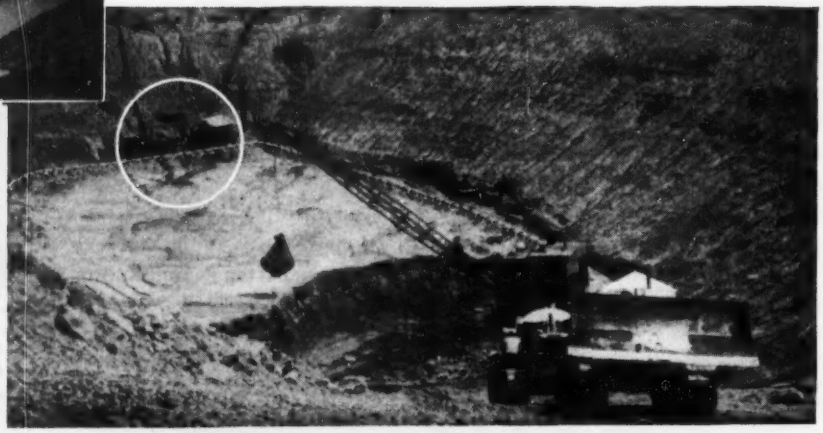
HOPKINS VOLCANIC SPECIALTIES, INC.
ALLIANCE, OHIO

STANG DEWATERS 65' DEEP 300' x 400' EXCAVATION FOR LIMESTONE MINE



Above—Flooded excavation of shaft for limestone mine, prior to installation of Sand Piles and Stang Wellpoints.

After heavy rain and snow, the banks of a 300' x 400' excavation, 65' deep, for the Mississippi Lime Company, became unstable as the groundwater table rose. Stang engineers recommended sand piles to drain water vertically down to the 20' layer of river sand lying just above the limestone. When the upper banks had been successfully stabilized, Stang Wellpoints were installed on top of the river sand, speedily dewatering it so that final excavation could proceed in the dry. Specially designed "shorty" wellpoints were used for this job.



Digging dry river sand predrained by Stang Wellpoints.

JOHN W. STANG CORPORATION
Engineers and Manufacturers of Dewatering Equipment

NEW YORK CITY, N. Y.	BELL, CALIFORNIA	OMAHA, NEBRASKA	TACOMA, WASH.
Number Two Broadway	8221 Atlantic Avenue	2123 South 56th Street	2339 Lincoln Avenue
Telephone: Whitehall 3-0065	Box 831 Ph: Logan 5-7421	Phone: Walnut 7796	Ph: Broadway 4362

THE MARTIN R4TL ALLOY STEEL TRAILER

Built throughout of high strength alloy steel, combining light weight with great strength.

- **Legal axle load is maintained!**
- **Weight is less than 8000 pounds!**
- **27 ton capacity!**
- **Low operating and maintenance costs!**

THESE WEIGHTS TELL THE STORY

Here are the actual recorded axle weights, under job conditions, of an R4TL alloy steel trailer, loaded with a mud-laden Caterpillar D8 Tractor equipped with Dozer, Cable Control and Canopy.

Axle	Weight in Pounds
Front	4920
Truck Tandem	31320
Trailer Tandem	31820
D8 Tractor	51640
Truck	8640

The Martin Alloy-Steel Trailer is primarily designed to haul equipment up to the Caterpillar D8 weight class and still remain within legal axle load limits in most states.

Fabricated throughout with high strength alloy steel, this trailer can be built lighter without sacrificing strength for handling capacity payloads.

Proper weight distribution lowers required pulling effort — reduces tire and brake wear — lessens fuel consumption — thus lowering operating and maintenance costs.

The alloy steel R4TL trailer is a standard model in the MARTIN line and is available at no increase in cost over the regular R4TL.

Your Martin-Caterpillar Dealer can give you more profitable details — see him and start saving on hauling costs with a Martin!

MARTIN Trailer

KEWANEE ILLINOIS

It's a Good Idea:

School for Construction Supervisors

A PRACTICAL COURSE on construction operations for construction supervisors is being taught by the University of Tennessee Extension School. The course, originated and sponsored by the Memphis Chapter Associated General Contractors, is open to any person working for active or associate members in a supervisory capacity in the construction field.

Outstanding contractors, engineers and architects are the instructors. Classes meet one night each week. Here are the subjects being covered:

1. **Introduction and Class Organization**

2. **The Building Industry**
   a. Rise and growth
   b. Duties and responsibilities of supervisors in the construction industry.

3. **Job Organization**
   a. Study of project plans and related contracts
   b. Determination of organization required and procurement of key personnel
   c. Field inspection and reports

4. **Job Layout**
   a. Site control and bench marks
   b. Provision for drainage during construction
   c. Location of temporary structures
   d. Location of storage areas
   e. Selection and location of equipment, hoists, mill and form yard
   f. Protection and care of equipment

5. **Job Administration and Records**
   a. W-4 forms and badges
   b. Contractors liability and wage-hour law
   c. Time records and cost distribution
   d. Purchase orders — delivery and receiving tickets (office and job copies)
   e. Liaison with subcontractors, architects and owners
   f. Change orders
   g. Job back charges

6. **Excavation and Grading**
   a. Rights and liabilities of owners, contractors and adjoining owners
   b. Determination of soil conditions and sampling operations
   c. Structural uses of soils
   d. Topographical survey
   e. Rough grading cut, fill and compaction
   f. Methods and equipment
   g. Substructure excavation (French or continuous footings —piers, borings)

7. **Foundations**
   a. Definition and types (spread, pile and pier foundations)
   b. Footings—wall, independent, combined, cantilever and continuous
   c. Retaining and breast walls—underpinning
   d. Drainage for foundations

8. **Form Construction**
   a. Design (field or office) marking, re-use, center of gravity
   b. Selection of material for forms
   c. Masonite, plywood, fir timber, Pine, T&G and S and E, roos, shores, column clamps, form ties, form lining, dry lumber, form oil or shellac. How to use the different materials economically

(Continued on page 134)

REPOWERED

and REJUVENATED with

S-N

REDUCTION GEARS

THEY EASE YOU THROUGH THE TOUGH ONES

Eliminate Costly Repairs— Replacements and Down Time

Insure "like-new" performance by repowering your industrial equipment with the world famous S-N heavy duty, herringbone Reduction Gears. Hundreds of S-N installations in construction equipment are being used to transmit the full power from engine to load smoothly, quietly . . . at the most economical speed of the driven equipment. They're built to lick the grueling, extra tough continuous assignments!

S-N Reduction Gears are available in a broad range of reduction ratios — of 1.5:1 up to 4.1 and from 50 to 900 H.P. Why not take advantage of the nearly half century of S-N transmission experience? Let S-N engineers specify the best unit for maximum performance on your equipment.

SNOW-NABSTEDT

Transmission Engineers

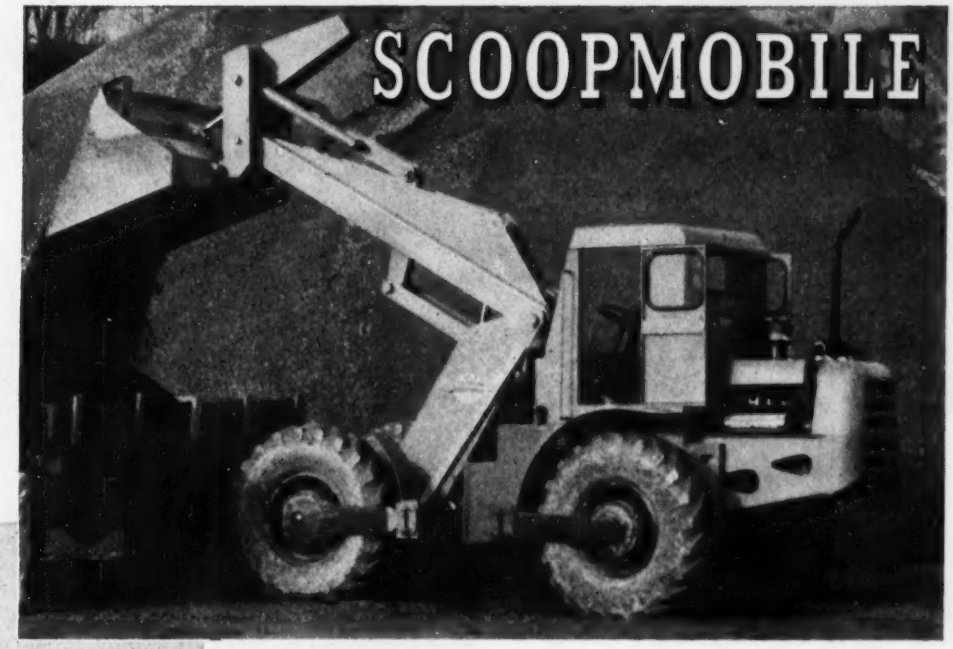
FOR NEARLY HALF A CENTURY

INDUSTRIAL DIVISION

THE SNOW-NABSTEDT GEAR CORP., HAMDEN, CONN.

4319 Yards in 31 Hours!

WITH NEW 4-WHEEL DRIVE, 4-WHEEL STEER



Right: 4-Wheel Drive Scoopmobile Model LD-10 loading sand

WITH ALL FOUR WHEELS supplying the driving power, this SCOOPMOBILE actually scooped, carried and loaded the amazing total of 4,319 yards of wet sand in 31 hours! Figure for yourself the advantage this performance will give you when submitting bids — how much more profitable your jobs will be.

Driving power is applied through 3-to-1 planetary gearing on all four wheels, providing added power and eliminating torque strain on axles and transmission. Center pin power steering makes maneuvering easy and quick.

The 4-wheel drive SCOOPMOBILE comes in two models: LD-10 with 1⅝ to 2 yards capacity (left, above), and LD-5 with capacity of ¾ to 1 yard (left, lower). Both are built to take the punishment of long, tough service, with weight built into the machine where strength is most important.

For further information on this new but thoroughly job tested 4-wheel drive SCOOPMOBILE, see your Mixermobile representative, or write us.

Built to do your job better, faster, easier

Dumping height with standard boom, 9 ft.
Powerful industrial type gasoline engine, with diesel power optional.
Road speed to 30 MPH under its own power, or can be towed at any speed desired.
Reversing transmission, 8 speeds forward and back.
All-hydraulic controls including power steering.
Full view cab, safety plate glass windows.

MIXERMOBILE DISTRIBUTORS, INC.

8027 N. E. KILLINGSWORTH STREET • P. O. BOX 7527 • PORTLAND 20, OREGON

Scoopmobile • Dueway Scoop • Dozermobile • Dueway Lift • Mixermobile
4-Wheel Drive Scoopmobile • 4-Wheel Drive Tractor
Towermobile • Stationary Mixer

Does
the wire rope
you use win this
kind of praise?
"I have preferred Hercules Red-Strand wire rope since 1909," says an operations superintendent. "I just wouldn't use any other." Another operator reports a truly remarkable record: "Red-Strand outlasted any other rope by three times!"
HERCULES Red-Strand earns it
Why do these men, among others, praise Red-Strand so highly? In a few words, it's because higher-than-rated quality in Red-Strand wire rope means longer-than-expected service . . . year in, year out.
Next time, use Hercules Red-Strand. You'll experience the difference too.
HIGHER-THAN-RATED QUALITY
LESCHEN
WIRE ROPE
AND SLINGS
A. LESCHEN & SONS ROPE COMPANY
HERCULES Red-Strand wire rope made by A. Leschen & Sons Rope Company, St. Louis 12, Missouri
In business only to make wire rope . . . better wire rope . . . since 1857
DISTRIBUTORS IN ALL PRINCIPAL CITIES

SUPERVISORS' SCHOOL

. . . Continued from page 132

d. Form erection. Nailing, bracing and form ties
e. Stripping, cleaning, oiling, storage and re-use

9. Steel
a. Reinforcing steel
b. Structural steel erection
c. Steel stud partitions and types—corrugated siding
d. Miscellaneous and ornamental iron

10. Concrete
a. Job mix
b. Ready mix
c. Placing
(1) waterproofing paper under floor slabs
(2) runways
(3) hoists and equipment
d. Screeds and expansion joints
e. Cement finish—topcoat, internal hardener and color
f. Test cylinder
g. Prestressed beams, slip form and tilt-up wall construction

11. Masonry
a. Brick
b. Clay
c. Structural glazed tile
d. Concrete blocks
e. Gypsum blocks
f. Granite
g. Cast stone
h. Mortar
i. Scaffolds, ladders and mortar boards

12. Carpentry work—Wood Construction
a. Rough framing (sub-floor, sheathing, exterior walls, roof, connecting devices)
b. Finishing—millwork
c. Tools (hand and electric)

13. Miscellaneous Construction
a. Screens and grills
b. Glass and glazing
c. Waterproofing and insulation
d. Refrigeration and air-conditioning
e. Landscaping (grading, planting and sodding)
f. Subcontracts
g. Roofing
h. Acoustics
i. Painting and finishes
j. Job cleanup

14. Human Relations
a. Giving orders
b. Treatment of personnel
c. Comforts for workmen
d. Handling disputes and grievances, etc.

15. Review and Examinations

ROCK RATED!

for the hardest years ahead

Your profits depend on the strength and speed of loading equipment — and P&H gives you more of *both*.

P&H *greater strength* comes from welded alloy steels — the toughest construction known. No wonder P&H can take pounding and shock loads that K.O. less rugged machines.

P&H *greater speed* comes from Magnetorque* Electric Swing — actually 15% to 25% faster than any other machine of its size to give you greater production, lower tonnage costs. And it's goodbye to maintenance and replacement problems for years to come . . . Magnetorque lasts the life of your P&H.

But to get fully acquainted with this outstanding producer, let us direct you to a 955-A in action. If you want bigger capacity, same advanced design, ask about the P&H 1055-A (3½ yd.)

P&H **MAGNETORQUE***

Electric Swing puts you beyond the "clutches of wear"

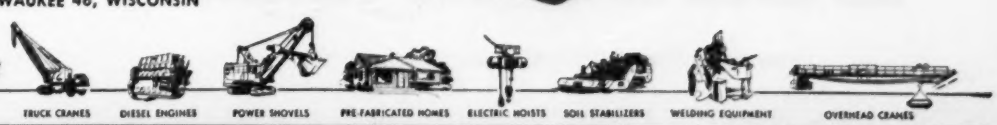
*T.M. of Harnischfeger Corporation for electro-magnetic type coupling.

P&H **LARGE EXCAVATOR DIVISION**

HARNISCHFEGER CORPORATION

4400 W. NATIONAL AVENUE • MILWAUKEE 46, WISCONSIN

the P&H *Line*



TRUCK CRANES · DIESEL ENGINES · POWER SHOVELS · PRE-FABRICATED HOMES · ELECTRIC HOISTS · SOIL STABILIZERS · WELDING EQUIPMENT · OVERHEAD CRANES

NEW HORSEPOWER!
NEW BRAKING POWER!
NEW EARNING POWER!

Biggest truck values of the year! New, just-announced Dodge trucks with features like . . .

7 high-compression engines, with 100 to 171 horsepower, give you more ton-miles per hour, more deliveries per day! New styling inside and out, tough new floors in pick-up and panel bodies, new tighter-than-ever tailgates on pick-ups and expresses! A total of more than 50 brand-new features to boost truck earning power!

More, you get such famous Dodge extra values as lightweight aluminum-alloy pistons, rivetless Cyclebond brake linings on all hydraulic brakes, moistureproof ignition, shot-peened rear axle shafts! Get more truck for your money . . . see your neighborly Dodge dealer!

NEW!

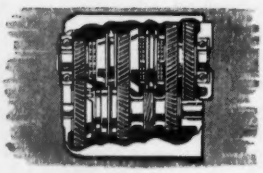
MORE POWERFUL ENGINES!

7 high-horsepower engines! 3 brand-new, with increased displacement, greater cooling capacity, twin carburetion available on larger trucks!

NEW!

BETTER BRAKING!

Super-safe brakes stop smoothly, easily, with less pedal pressure! New increased stopping ability on 1- thru 2½-ton trucks!



NEW!

NO GEAR-SHIFTING!

Truck-o-matic transmission with gyrol Fluid Drive available on ½- and ¾-ton models! Saves shifting, yet lets you rock out of snow, mud!

NEW!

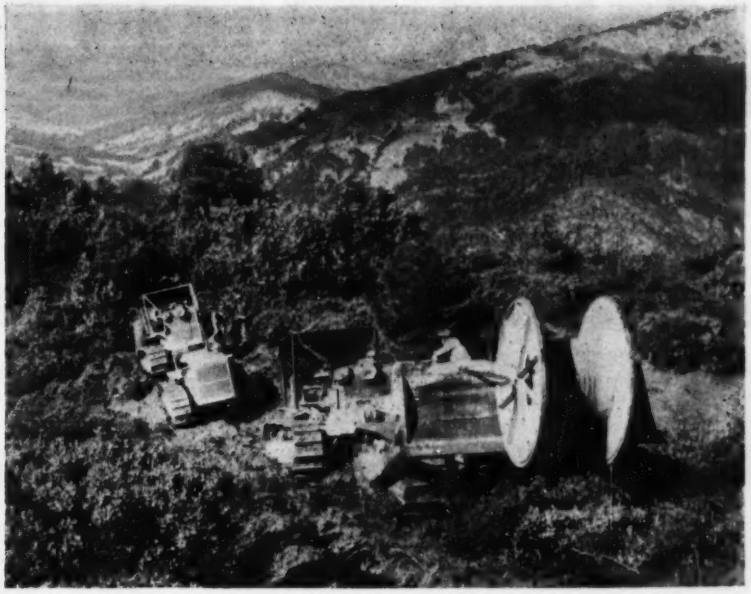
OVER 50 FEATURES!

Reinforced cab construction, larger exhaust system, new 116″ wheelbase ½-ton pick-up! Dodge-Tint glass, higher output heaters available!

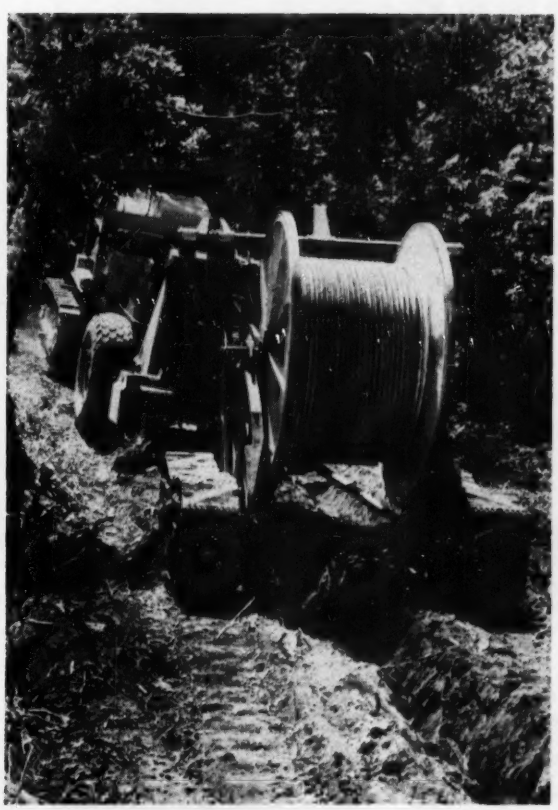
There's one to fit your job . . . ½-ton through 4-ton. See your friendly Dodge dealer.

DODGE "Job-Rated" TRUCKS

Cable Laying in Wild West Calls for Big Tractor Power



FOURSOME of Caterpillar D8's teams up to pull telephone cable layer up a grade at El 4,500 north of Cummings, Calif. Underground Construction Co., Oakland, is laying 1¾-in. long-distance cable, carrying 200 pairs of wires, over a 25-mi section between San Francisco and Eureka. The first operation is handled by two of the crawlers with bulldozers as they ram and slash their way over the route to clear the way. The two others follow up behind with rippers to break open a trench for the cable. The lead tractor is carrying an empty reel on its blade, soon to be exchanged for another full one.



BUSINESS END of the hard-working procession is the cable layer which opens up a deep furrow to receive the wire as it unwinds from the reel. Reels are 88 in. in dia, 46 in. wide and carry approximately 3,000 ft of the prefabricated underground cable. A full reel weighs about 7 tons, but is carried easily over all types of terrain on its sure-footed, wide tracklayers. Not all of the going is as smooth as this picture would indicate.

FULL REEL of cable coming up. The lead tractor is unhooked from the cable layer when cable starts running low on the reel in use and takes its empty spool to the supply area to trade it for a full one. Big tractor handles load easily but with this 7-ton weight on the dozer, the D8 backs down the hills. Brute power is needed in this mountain country, as evidenced by the rock ripped up in preparing the way for the cable layer.

THINK BIG... WHEN YOU

BIG CAPACITY **BIG PROFIT**

BIG PERFORMANCE

THINK CEDARAPIDS...

for higher percentages of secondary crushing and greater screening capacity

THE COMMANDER

Here's a plant that averaged 350 tons per hour of 1" material *with 20% crush* on a job in Minnesota. In another pit, the Commander produced 445 tons of ¾" material per hour with approximately 12% to 15% crushing! That's the kind of output that lets you *think big* about aggregate production and profit.

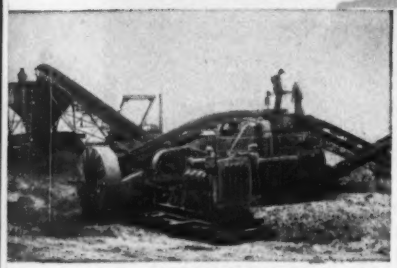
The Cedarapids Commander was designed specifically for producers who need greater output of fine-crushed products, or whose pit conditions put a bigger load on the secondary crusher. The big 30" by 22" roll crusher increases secondary crushing capacity by approximately 50% and steps up the stage of reduction.

To balance out this greater roll crusher output, the large 48" x 10' two-and-a-half deck horizontal vibrating screen provides 30% more screening capacity for the plant. The feed conveyor, delivery conveyors and under-crusher conveyor are 30" wide to handle the higher capacity of the plant. Best of all, *maintenance and operating costs are as low as on other Cedarapids plants!*

ANOTHER Cedarapids PRODUCT

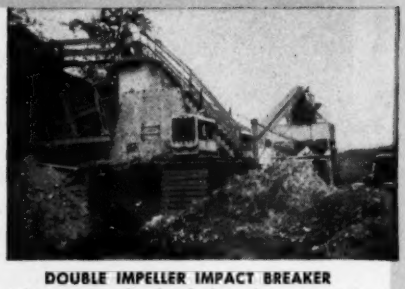
The Commander is loaded with other big production features. Ask Commander owners for facts and figures or see your Cedarapids distributor for complete details.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.



MASTER TANDEM
Here's the biggest all-around gravel producer in the Iowa line. With a 10" x 36" jaw crusher, 40" x 22" roll crusher and 48" x 12' screen, the Master Tandem is really the master of low-cost, big volume production on a wide variety of crushing and screening jobs.

PITMASTER
This is the plant you'll want for smaller jobs. The Pitmaster's 10" x 16" jaw crusher, 16" x 16" roll crusher and 30" x 9'5" screen assure excellent production and extremely economical operation. For pits with a higher percent of oversize, ask about the Twin Jaw Pitmaster.



DOUBLE IMPELLER IMPACT BREAKER
When you need cubical shaped aggregate in tremendous volume, check the performance records of this impact breaker. On one job, the big Model 5050 established a peak production record of 724 tons per hour. Exceptionally low-cost operation assures a high return on your investment.

THINK OF AGGREGATE PRODUCTION

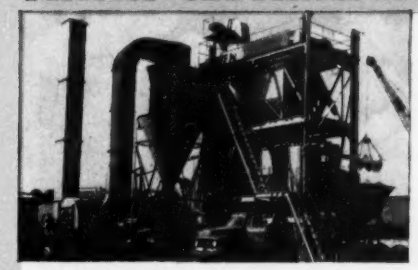
Solving the "growing-pain" problems of our highway system is a real job. It *can* be done, but it will take big thinking. Billions of tons of aggregate are needed to keep America on wheels. *Think big* about equipment to produce it!

Think of equipment that produces greater hourly tonnages than ever before . . . equipment that's quality-built to take a daily beating in the world's toughest industry, and still keep slugging away, month after month. Think about the bidding advantages of equipment that combines big capacities with low operating and maintenance expense to hold per ton costs to levels comparable with those of twenty years ago!

You American contractors have the know-how to solve the critical highway problem . . . Cedarapids provides the equipment to help you *think big* about profitable production of big volumes of aggregate.

FOR EVERY CRUSHING AND SCREENING JOB

THINK CEDARAPIDS . . . WHEN YOU THINK BLACK TOP

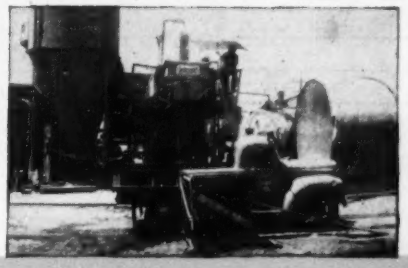


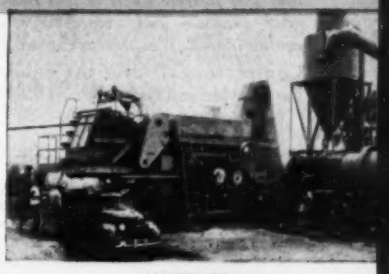
MODEL E

Two tons at a batch is average production for this Cedarapids Bituminous Mixing Plant. All-electric operation plus automatic time controls, signal lights and air controls insure absolute accuracy of mix and profitable production for low-bidding contractors.

MASTER PLANT

This two unit continuous-mix plant combines the Cedarapids Master Mixer and Gradation Control to supply specification mix in big volume. The mixing unit is offered with either a twin shaft pugmill which conforms to all existing specifications, or a single shaft pugmill designed for high speed, vigorous mixing.





MODEL FA

The most portable batch type bituminous mixer in the Cedarapids line. The FA can be set up for operation in a matter of hours. Centralized controls insure fast, easy, one-man operation. Balanced coordination of every part produces up to 350 tons per day of accurately weighed and uniformly mixed aggregates and bitumen. Quality-built for long-term service at lowest cost.

This Is Old Stuff...

...But Worth Reviewing

WINTER WEATHER comes regularly to most parts of the country, and the average equipment maintenance man knows how to prepare the machines in his charge for frigid temperatures and to keep them at high efficiency.

Yet neglect creeps in, bringing abuse and ruin, so construction equipment manufacturers make a point of publishing cold-weather tips each year. This reminder was sent our way by the Allis-Chalmers Manufacturing Co. We are glad to give it as wide a reading as possible. Good winter care means more money in the bank.

• **Batteries** are one of the important check points for cold weather equipment efficiency. Battery failure in below-freezing temperatures is a constant threat to winter operations.

A battery which is fully charged at 80 deg F has only about 60% capacity at 20 deg F, and only 20% capacity at minus 20 deg F. Thus it is obvious that batteries must be kept in the best possible condition in cold weather.

In extreme cold weather there is danger of batteries freezing if the specific gravity is low. Batteries with a specific gravity of 1.225 will freeze at minus 35 deg F. During freezing weather of any intensity, any addition of water to batteries should be made after the engine is started at the beginning of an operating period. This will assure the thorough mixing of water and the electrolyte solution.

Correct It

The electrolyte in a fully charged battery will have a hydrometer reading of 1.275 to 1.285 specific gravity when corrected to 77 deg F. Specific gravity readings without correction for temperature are practically meaningless.

For each 30 deg F that the temperature of the electrolyte is above 77 deg F add 10 points to get the true specific gravity and, for each 30 deg F that the temperature of the electrolyte is above 77 deg F, subtract 10 points from the hydrometer reading. For example, if the hydrometer reading is 1.250 and the electrolyte temperature is 17 deg F (60 deg below 77 deg F), 1.250 minus 20 is 1.230—the true specific gravity of the battery at that temperature.

What it Means

If corrected readings are below 1.240, the battery is not sufficienlty charged. This might indicate that the generator or regulator requires attention. If these units are found to be satisfactory, inspect the wiring for short circuits, loose or corroded connections.

Check the level of the electrolyte in batteries weekly or as often as operation conditions prove it necessary. Maintain the level of the solution ⅜ in. above the plates by adding clean distilled water. Keep all battery and cable terminals tight and clean.

Filler caps must be kept tight at all times and tops of batteries must be kept clean and dry. If corrosion occurs, clean the battery posts and terminals with a strong soda solution, then coat terminals tightly with vaseline before connecting them again. The vaseline will prevent further corrosion.

(Continued on page 144)

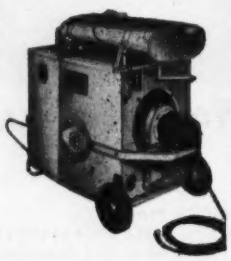
Keep your jobs moving this winter . . . *regardless of weather*

HERMAN NELSON PORTABLE HEATERS

There's no reason why your winter schedules should be upset by bad weather this year. You can keep your jobs moving and your workers more comfortable if you put Herman Nelson Portable Heaters to work for you. These furnaces on wheels provide clean, pure, hot air to warm your workers, protect concrete pours, thaw machinery, dry plaster—do scores of other heating and drying jobs.

The only completely safe portable heater that uses flexible ducts to spot heat where most needed—and remember, only uncontaminated air heaters are absolutely safe!

Contractors all over the country are buying Herman Nelson Portable Heaters. Many users find that these units pay for themselves during the first winter. Investigate how you can beat winter weather on your job. Mail the coupon below for full information.



HERMAN NELSON ECONOMY MODEL
Priced lower for the smaller jobs. Capacity 125,000-190,000 BTU/hr. Oil fired, electric powered. Costs only 19¢ per hour to operate. Other models available—electric or gasoline powered with capacities to 450,000 BTU/hr.

Herman Nelson Division, Dept. 16
American Air Filter Company, Inc., Moline, Illinois
Gentlemen: Please send me complete information about Herman Nelson Portable Heaters and a free copy of your Cost Control Booklet.

Name_____

Title_____

Company_____

Address_____

City_____ State_____

Constant Pounding Causes this—

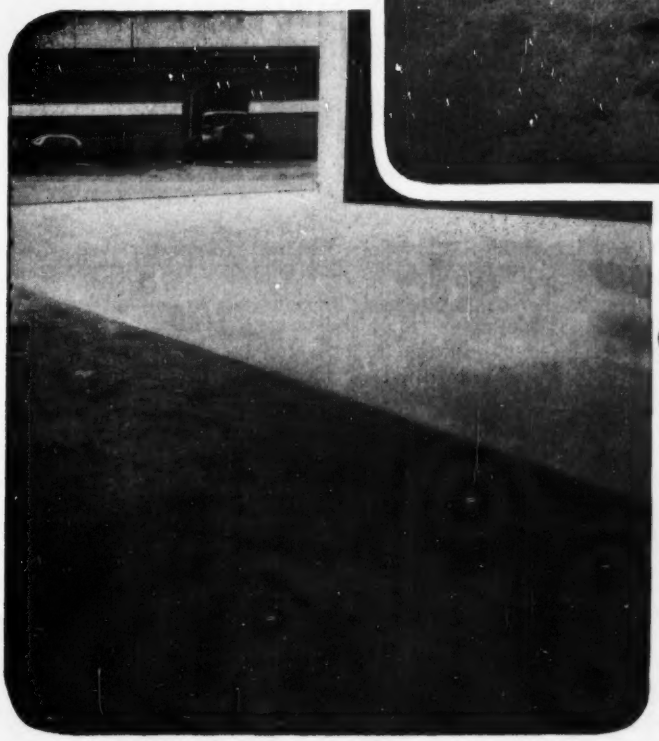
How THORITE Patching Mortar, repaired and added strength to loading platform in 30 minutes

A QUICK PATCH for concrete walls and floors

Smaller areas, around large one, is in complete state of disintegration.

BEFORE

Largest area is 2' long and 18" wide, 1½" deep.



AFTER

Thorite Patching Mortar has been brushed and troweled into patch and leveled, even with surrounding surfaces.

Floor area was back in use, for heavy warehouse trucks, 30 minutes after beginning work.

Get our 20-page brochure pictorially describing in detail "HOW TO DO IT". It's yours for the asking!

Standard Dry Wall Products
NEW EAGLE, PENNSYLVANIA
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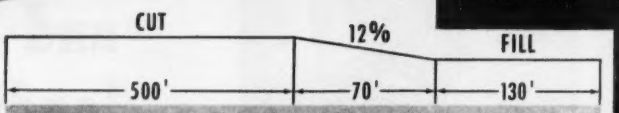
51 PAYLOADS AN HOUR



Haul conditions on Grandview Construction Company's New York Thruway contract, at Selkirk, N. Y.

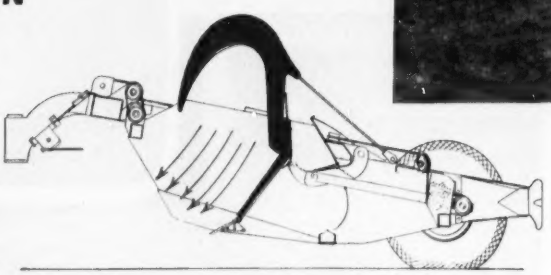
LOAD—haul—spread—and return up a 12% grade—*51 times per hour!* That's the record of the three Heiliners owned by Grandview Construction Company of Mt. Vernon, N. Y. Moving 1,400,000 cu. yds. of sand clay with a heavy water content, each Heiliner made 17 trips per hour —with an average cycle time of 2 min. 56 sec.

Here's the kind of fast-stepping Heiliner performance which makes earthmoving profitable. It's the kind of production that gives *you* the edge when bids are let.

Positive "TILTING FLOOR" EJECTION HELPS SLASH CYCLE TIME!

On Grandview's New York Thruway job, spread and turn time averaged 15.9 seconds . . . spreading heavy, sticky sand clay! It's proof positive that the Heiliner's *positive* "Tilting Floor" ejection helps cut cycle time to the bone.

Heil's exclusive "Tilting Floor" ejection is the simplest type of forced ejection known. The floor of bowl is hinged back of the cutting blade. As the rear push-out ram is activated by the relatively low line pull, the floor simply tilts up to a maximum discharge angle of 75°. The load is forced out the wide front opening, while even the stickiest material is scoured from the sides and stationary back of the bowl. Material is dumped fast and clean . . . there's no extra yardage left in the bowl to cut down the size of your next load.



WITH THREE FAST-STEPPING HEILINERS

STEP UP *YOUR* EARTHMOVING PROFITS WITH THESE HEILINER ADVANTAGES!

For faster loading, the dirt "boils" up in the center of the bowl, loading front and back evenly so no long pull is necessary to fill clear to the back. Haul speed is *fast* . . . 25 MPH fully loaded. The powerful 200 HP Cummins diesel gives you lugging power to spare, while big 24:00 x 29 tires with wide-base rims provide the extra traction and flotation you need in soft going. Heil's exclusive, patented Hydro-Steer handles with passenger car ease . . . this easy steering control plus big, safe four-wheel brakes give operators confidence to use the full power and speed of the rig. Heil's famous planetary drive, with full 4" gear faces on sun and planet gears, provides a low-torque drive for smoother, more positive power transmission to each wheel, and permits full utilization of engine horsepower.

Heiliners are designed from the ground up with many other features to keep up a profit-making pace on every job, shift after shift. Watch a Heiliner on the job, then ask your Heil distributor for complete details about every feature.

8-2

THE HEIL CO.

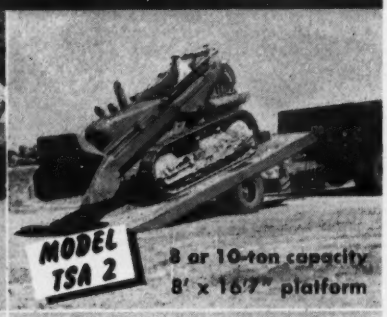
3002 WEST MONTANA STREET • MILWAUKEE 1, WISCONSIN

DEPARTMENT 223

FACTORIES: MILWAUKEE, WIS., HILLSIDE, N. J.

District Offices: Hillside, Washington, D.C., Atlanta, Cleveland, Milwaukee, Detroit, Chicago, Kansas City, Denver, Dallas, Los Angeles, Seattle.

SAVE 3 to 4 hours
on every equipment move with LaCROSSE TILT TRAILERS



Easily loaded or unloaded in 5 min. by 1 man!

With a LaCrosse Tilt Top, *your truck driver alone* can handle the time-consuming job of loading and unloading equipment. No ramps to build! No blocking or cribbing! No high-priced labor crews tied-up on non-productive tasks! Just tilt . . . load . . . and you're ready to roll in 5 minutes. LaCrosse Tilt Trailers are economical to own . . . a size and model for every need. Write for prices and free descriptive literature.

. . . also standard low-beds up to 67 tons capacity

LC-26

Check Today!

LaCROSSE TRAILER CORPORATION, LaCrosse, Wis.

Rush complete information on LaCrosse trailers:

☐ Gooseneck Tilt ☐ Draw-bar Tilt ☐ Standard Low-Bed

☐ Send name of nearest LaCrosse Distributor.

☐ We may buy a ..... ton trailer about ..... (date)

Name..... Title.....

Employed by.....

Address.....

City..... State.....

LaCROSSE

America's Favorite LOW-BED TRAILER

OLD STUFF . . .

Continued from page 140

• **Cooling systems** should be maintained at about 160 deg to 180 deg F to insure complete combustion and prevent sludge and gum deposits within engines.

Proper functioning of the thermostat is a primary factor in maintaining a correct cooling system temperature. Check it if the engine temperature cannot be maintained within the normal range.

To check a thermostat without removing it, operate the engine to see if the water within the block and cylinder head warms up while the water in the radiator remains cold. If water in the radiator warms up as quickly as that in the cylinder head, the thermostat is stuck open. If it is stuck closed, the thermostat will not open although the water in the engine becomes extremely hot while at the same time the water in the radiator remains cold.

Check in a Bucket

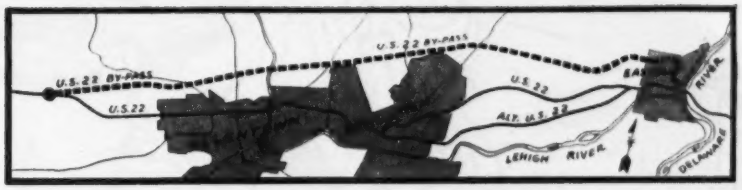
To check a thermostat out of the engine, heat a container of water in which a thermostat and a suitable thermometer have been immersed. When the water has reached a temperature of 105 to 160 deg F, the thermostat should begin to open. It should be wide open at about 185 deg F. Stir the water to obtain a uniform temperature. If the thermostat is corroded and stuck, or if the bellows of the unit leaks, install a new unit.

Inspect the cooling system carefully. Check the radiator for leaks, see that all hose and gaskets are in good condition. Be sure that all connections are tight. This will prevent damage to your machine and prevent loss of anti-freeze.

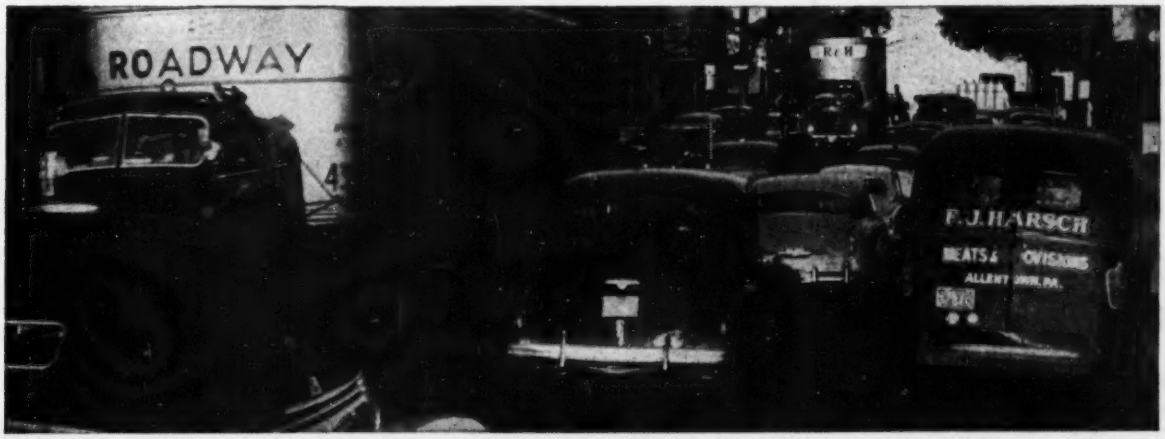
Pour Point of Fuel

• **The fuel** you use most of the season may be a little heavy for winter operation. Be sure that the pour point of the fuel you are using is low enough to permit it to flow freely under prevailing temperatures. For cold weather operations it is known that lighter fuels have a lower pour point and the cetane number is higher along with a distillation end point.

These are the little things which determine easy starting and clean burning. Keep your fuel clean and don't forget to drain those sediment sumps under the fuel tank every night.



New by-pass to ease congestion in Lehigh Valley area



This bottleneck on Allentown's Tilghman Street is one of many along the present congested Route 22 that the new by-pass is intended to relieve.

Below: **The western end of the new Route 22 by-pass, just outside of Allentown. The 4-lane highway will run north of Allentown and Bethlehem, and re-join old Route 22 at Easton. Completion is expected in late 1953 or mid 1954.**

One of the critical traffic bottlenecks in Pennsylvania is in the heavily-populated Allentown-Bethlehem-Easton area of the Lehigh Valley. Here Route 22 winds through three industrial cities, and tourists and truckers battle traffic stymied by narrow bridges, stoplights and urban rush hour buses and automobiles.

A new 4-lane high-speed by-pass, 22.5 miles long and now under construction, will skirt this area to the north, substantially cutting the time needed to pass from the New Jersey state line to the highways leading west.

This $16,000,000 limited-access highway will have two 24-foot roadways with a 16-foot medial strip. Traffic interchanges will permit the free flow of traffic on and off the by-pass, and grade crossings will be eliminated by under- and overpasses. Bethlehem Steel is furnishing structural shapes, reinforcing steel, dowel units and guard rails.

With 52,000,000 registered vehicles on the road today, the work that state highway departments and roadbuilders are doing to relieve congested highways throughout the country is of tremendous importance. The Route 22 by-pass is one good example of how this work is going forward.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

STEEL FOR HIGHWAYS

BETHLEHEM STEEL

Dowel Units • Reinforcing Bars • Guard Rail
Guard Rail Posts • Wire Rope and Strand • Pipe
Hollow Drill Steel • Spikes • Bolts and Nuts • Tie-Rods
Timber Bridge Hardware • Sheet- and H-Piling

ARE MAINTENANCE

. . . then check the BLAW-KNOX "COMPLETE

EVEN the best of equipment needs maintenance and repair, and when one machine goes down, your whole project marks time. You can avoid such maintenance bottlenecks by taking advantage of *all* the benefits offered by a "Package" paving system, because the Blaw-Knox "Complete Package" is more than just a package of equipment . . . it's a one-source package of *everything* you need . . . from experienced assistance with your problems, right down to preventive maintenance to help you eliminate bottlenecks.

When you get all your equipment from one source, you can be sure that each machine is engineered to match the others in size, capacity and operation. You get the most efficient sequence of operations without overtaxing some machines to keep up with the others. Balanced production with Blaw-Knox matched equipment reduces breakdowns and keeps operations flowing at a steady, productive pace.

BLAW-KNOX

BLAW-KNOX EQUIPMENT

Farmers Bank Building

NEW YORK • CHICAGO • PHILADELPHIA

BOTTLENECKS CHOKING YOUR PROFITS?

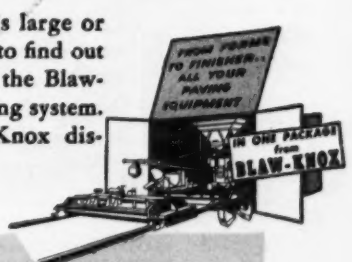
ONE-SOURCE advantages of the PACKAGE" of concrete paving equipment

With one-source equipment, you have the advantages of one-source maintenance and repair service for *all* your equipment. There's no need to waste time and effort running down the parts or service you need . . . often one phone call to your Blaw-Knox distributor is all that's required, because one Blaw-Knox trained man can service *all* your package equipment. And when he services the machine that needs immediate attention, he can check over all the rest of your equipment to stop trouble before it starts. Preventive maintenance is standard practice when all your equipment belongs to one family. From your Blaw-Knox distributor you get prompt service on genuine factory-built parts as well as expert attention to your problems from men who are experienced on all kinds of construction work, who know "package" operation backwards and forwards and who are trained to help you get the most out of your equipment.

In addition, you get all these other one-source advantages . . . you get every piece of equipment you need *in a package to fit your specific job.* You get it all on one order, in one shipment, with just one financial contact, and backed by one reliable manufacturer who gladly assumes responsibility for the field performance of all your equipment.

When you bid successfully on a contract, your battle starts against weather, supplies and aggravating downtime. Blaw-Knox can't do anything about the weather, but when you use the Blaw-Knox "Complete Package" of equipment and service, you can be sure of licking profit-choking maintenance bottlenecks.

Whether your job is large or small, it will pay you to find out all the advantages of the Blaw-Knox "Package" paving system. Talk to your Blaw-Knox distributor today.

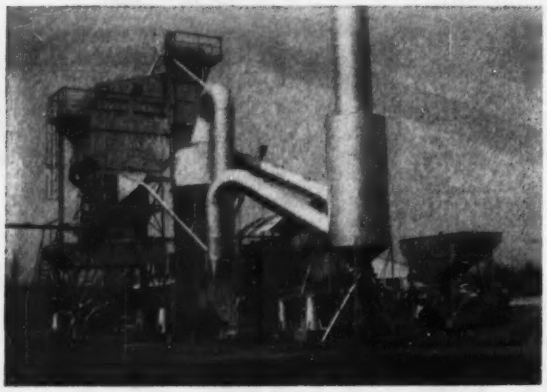


DIVISION of Blaw-Knox Company
Pittsburgh 22, Pennsylvania
BIRMINGHAM • WASHINGTON • SAN FRANCISCO

BLAW-KNOX

Contractors Are Making Highway History with Dependable, Profitable

CUMMER ASPHALT PLANTS



The Cummer Asphalt Plant pictured here, owned and operated by Asphaltic Concrete Co., Rochester, N. Y. consistently produces 80-100 tons per hour (based on 5% initial water content, dried to within ½ of 1% and heated to 350° to 400°F.)

Located in a congested area, this complete plant is equipped with dust elevator, washer, enclosed hot elevator, and is electrically powered. Each unit is individually driven.

•

FAMOUS CUMMER ASPHALT PLANTS, ruggedly built for years of service, are designed to increase the profit and efficiency of your highway construction operations.

Consider these superior CUMMER features:

Mixing towers with vibrating screens and mixer.
Dust collector discharging reclaimed dust into hot elevator.
Two furnace combustion with low pressure burner equipment.
Cold storage bin and feeder.
Enclosed hot elevator.
Diesel or electric power.

CUMMER PLANTS—complete with all motor and starter switches—are available in sizes from 55 to 100 tons per hour

Send for your copy of the descriptive Cummer Catalog today

THE F. D. CUMMER & SON COMPANY

Pioneer Builders of Fine Asphalt Plants

CLEVELAND 14, OHIO

ADVANCE SCAFFOLDING

- **DESIGNED FOR SAFETY**
- **PRICED FOR SAVINGS**

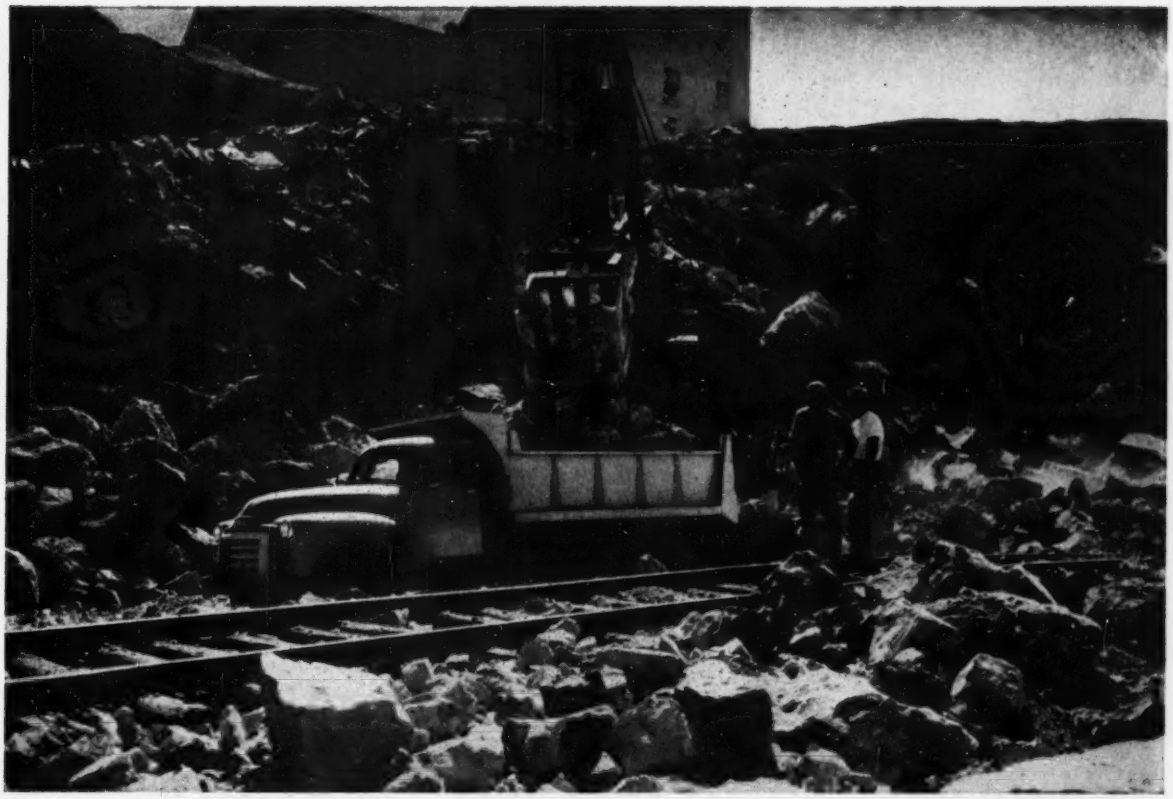
The versatility and safety features of ADVANCE tubular steel scaffolding means money-in-the-pocket for building and trade contractors or building owners. Patented Cam Locks and Stack Locks, which are made an integral part of each panel or brace, eliminate nuts, bolts and similar methods of attachment. This means speedy, one-man erection to any height, and a solid, firm structure, rigid in all directions.

Ask your dealer about ADVANCE scaffolding for advanced methods of construction and maintenance. Or, write direct for free literature, engineering and specification data.

BEAVER-ADVANCE products are distributed nationally through industrial and construction equipment dealers. Inquiries re distributorships are invited.

BEAVER ADVANCE

ADVANCE SCAFFOLD DIVISION
BEAVER ART METAL CORPORATION
ELLWOOD CITY, 3, PA.



GMC's W450-30 SIX-WHEELER gets the extra drive for hauling like this from a revolutionary new truck engine. It's GMC's great new "302"—pound-for-pound the mightiest in trucking history. Its 145 rugged horsepower is delivered under record-shattering 7.2 to 1 compression ratio—on regular gasoline.

Built Extra-Rugged—for Extra-Rugged Jobs

NO OTHER 26,000 GVW SIX-WHEELER TODAY can zoom capacity loads up tough grades like GMC's new W450-30. It will haul over the toughest terrain with less shifting than any comparable truck in service. Extra-long, *extra-tough* springs cushion out damaging jars and jolts.

NO other 26,000 GVW six-wheeler today combines the power and rim-to-roof ruggedness you find in GMC's new W450-30.

That makes it your soundest choice for the kind of trips and tonnage that would wilt an ordinary truck. Its 145 husky horsepower is unmatched in any comparable hauler. And this mighty drive is harnessed to a rock-ribbed chassis — *all-truck* construction that defies battering off-the-road operation.

An extra inter-axle differential compensates for uneven tire wear—prevents "tire fight" caused by unequal revolutions per mile. But an optional lockout* lets you pour equal power to all four drive wheels simultaneously. The two brawny rear axles really pack a punch when you're wrestling capacity loads up "killer" grades.

But that's only part of the W450-30 story. Get the rest of it—and the surprisingly low price — from your GMC dealer. Find out for yourself why the harder you use a truck, the more you need this GMC!

*Optional at extra cost

GMC TRUCKS

GASOLINE 4,800 GVW TO 90,000 GCW
DIESEL 19,500 GVW TO 100,000 GCW

Another General Motors Value

GMC Truck & Coach Division of General Motors

HIGH QUALITY MUD SLINGER!

To a contractor, keeping a gimlet eye on grading problems is as vital as the weather. A Shunk blade on his 'dozer assures him a high quality mud slinger which can take punishment almost forever.

To the original equipment producer, the Shunk blade, as an integral part of his product, means the assurance of almost a century of development. Shunk's modern production facilities, quality product and reputation *guarantee* favorable competitive relationships.

Need a high quality mud slinger? We'll gladly provide you with full information.

3000 DIFFERENT SPECIFICATIONS

GRADER BLADES

MOLD BOARDS

SCARIFYING BLADES

WRITE FOR OUR NEW CATALOG

Shunk MANUFACTURING COMPANY

In Our 98th Year

BEST BLADES MADE

BUCYRUS, OHIO

What's Needed and What's Coming in Military Earth-Moving Equipment

MILITARY AND CIVILIAN equipment experts got together for two days recently at Port Hueneme, Calif., to take stock on development of military earth-moving equipment.

In brief, the need is for equipment that can be airborne and for high-speed, high-capacity units that can build the longer airfields of today. New developments center around use of the torque converter and unique power plants, such as gas turbine and electric drives.

The sessions were sponsored by the Navy's Bureau of Yards and Docks and the U.S. Naval Civil Engineering Research and Evaluation Laboratory. Rear Adm. J. F. Jelley, CEC, USN, chief of the Bureau, and Comdr. W. E. Davidson, CEC, USN, officer in charge of the laboratory, participated in the meetings.

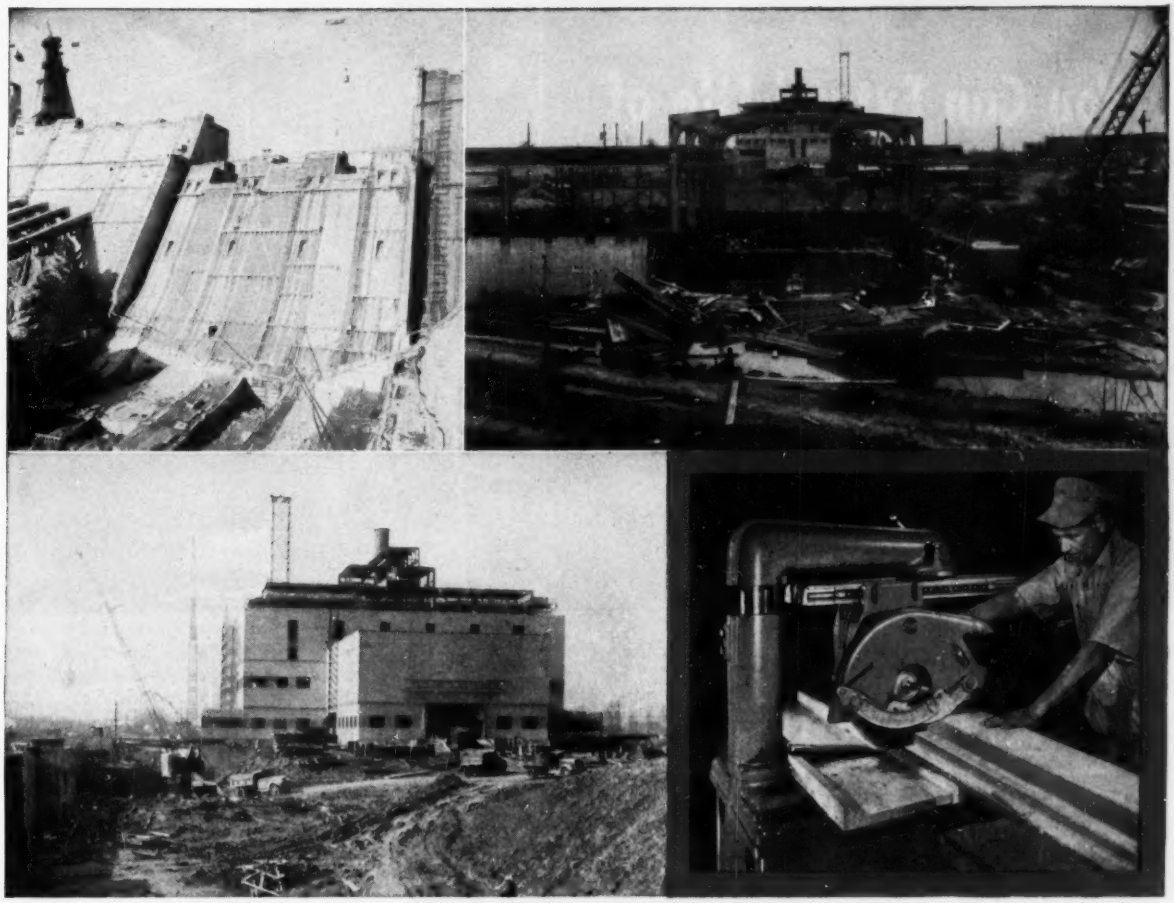
• **Requirements**—In summary, the military needs development of new and more efficient types of earth-moving equipment; more simplicity in the production and in the operation of earth-moving equipment; and multi-purpose types which offer a flexibility in operation and a definite means toward assuring the accomplishment of assigned tasks. Some of this is a natural desire for increased efficiency, but part of it is because the requirements have changed in very recent years.

With the growing size of air fields from 4,000 ft to 10,000 ft, there is a growing need for high-speed, high-capacity earth-moving equipment. Long haul roads and large cuts and fills have necessitated changes from standard crawler units to fast, preferably self-loading, rubber-tired units.

Much of the equipment under development by the Armed Forces is especially designed to meet airborne requirements. Plane design at present imposes these restrictions: 8-ft width, 8-ft height, 37-ft length, with a total weight ready for operation of 16,000 lb.

Another speaker pointed out that this equipment must perform under extremely rugged condi-

(Continued on page 153)



On projects like these **DELTA** Radial Saws save Hunkin-Conkey thousands of dollars

Delta saws do the work of ten men in cutting—yet actual machine cost is less than 30 cents an hour.

A battery of Delta Radial Saws for on-the-job use at construction projects is chalking up annual savings running well into five figures, says Hunkin-Conkey Construction Company of Cleveland, Ohio.

Several of these saws have been in regular use, averaging more than 6 hours per day, for better than 10 years. There's been practically no maintenance—and at actual machine cost, except labor, of less than 30 cents an hour. They do more accurate work than other saws, do it much faster. Workers like the Delta saws for their ease of operation and their excellent safety features.

Savings like these are possible with the new Delta radial saw because of its many exclusive "extras"—rugged construction, 360° turret action, easy-to-reach up front controls—and many others.

For full information consult your Delta dealer (he's listed in the classified telephone directory under Tools) or write Delta Power Tool Division, Rockwell Manufacturing Company, 658B N. Lexington Ave., Pittsburgh 8, Pa.

MACHINE COST LESS THAN 30¢ AN HOUR

Based on 6 hours operation per day or 1500 hours a year, hourly saw cost figures just under 30 cents, as follows:

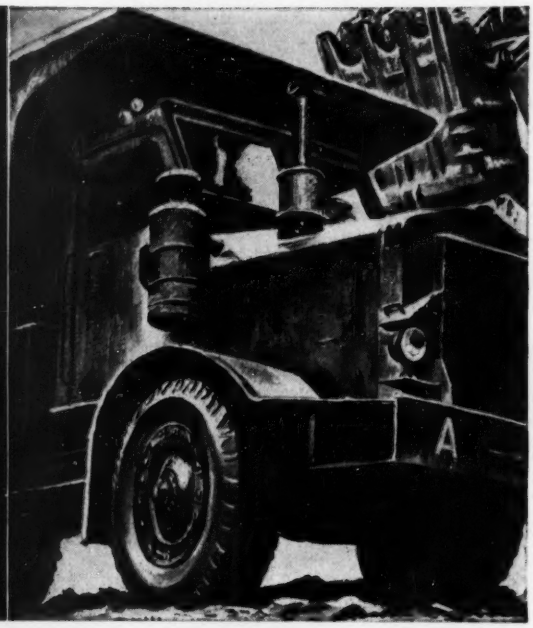
	Per Year	Per Hour
Depreciation 10% and average interest 2% on Delta 16" Radial Saw	$75	$ .05
Maintenance and Repairs (average of 7 saws)	30	.02
Saw blade depreciation	36	.024
Saw sharpening, 3 16" blades per week	150	.10
Power cost, 7½ H.P. motor		.10
Total machine cost per hour		.294

DELTA MILWAUKEE MAKES THE DIFFERENCE

DELTA QUALITY POWER TOOLS

Another Product by **Rockwell**

You Can Extend Life of ENGINES, TRANSMISSIONS and DIFFERENTIALS



With Allison Torqmatic Drives

BASED on user records, heavy-duty trucks equipped with Allison TORQMATIC CONVERTERS and TRANSMISSIONS *last longer and cost less to operate* than trucks with mechanical drives.

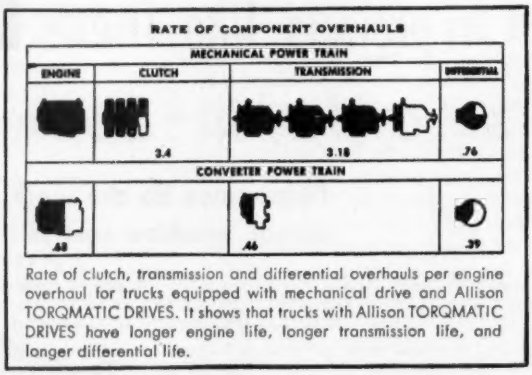
Records show that Allison TORQMATIC DRIVES boost truck availability, enabling operators to improve their schedules and, thus, they can do more business.

Trucks — and other heavy equipment — with Allison TORQMATIC DRIVES use the flexibility of the converter to start heavy loads and make shock-free gear shifts at full power. The Allison TORQMATIC DRIVES automatically balance engine power with the load requirement. This automatic operation makes the driver's job easier and reduces wear on the whole unit—thus cutting maintenance cost.

You are interested! Attach this advertisement to your letterhead and send it to Allison. You will receive detailed evidence on what these Allison TORQMATIC DRIVES will do for you.

And the next time you're ordering heavy-duty equipment, you'll ask your dealer or manufacturer for units with Allison TORQMATIC DRIVES.

ALLISON *Division of* GENERAL MOTORS
Box 894TT, Indianapolis 6, Indiana



Rate of clutch, transmission and differential overhauls per engine overhaul for trucks equipped with mechanical drive and Allison TORQMATIC DRIVES. It shows that trucks with Allison TORQMATIC DRIVES have longer engine life, longer transmission life, and longer differential life.

MATCHED UNITS BUILT BY ONE MANUFACTURER

Allison TORQMATIC DRIVES

COMPACT, EFFICIENT HYDRAULIC DRIVE FOR TRUCKS * CRANES * TRACTORS * SHOVELS * DRILLING RIGS

MILITARY NEEDS . . .

Cont. from p. 150

tions. It is important too, that fewer critical materials be used. It has been demonstrated that critical alloying elements can be conserved without decreasing in any way the service performance of the parts concerned. Induction hardening has enormous possibilities for producing satisfactory parts from plain carbon steel, where alloy steels were employed previously.

• **Torque converters**—Several military and industrial representatives indicated that the torque converter transmission is one of the foremost recent developments. They were careful to point out the higher fuel consumption—up to 35% more—of the torque converter unit under certain conditions. However, this increased fuel consumption was recovered in increased work output and lower maintenance.

In a test on a bulldozing operation covering a complete cycle, working with forward and reverse load, the torque converter indicated approximately 22% more work output than the step-gear transmission. In straight pulling or long haul operations with a minimum number of shifts, the step-gear unit may out-perform the torque unit, but this is not the usual type of work encountered. Also of note is the reduced need for operator training and reduced operator fatigue.

In summary, cost advantages for the torque converter lie in the higher average speed, improved differential life, probable increased engine life, reduction in driver fatigue, a more favorable operator reaction, and elimination of the necessity for well engineered haul roads.

• **Power plant development**—One instance of new motive power pioneered for military use is electrically driven equipment. Two units have been built; one, a six-wheel drive and steer scraper for the Bureau of Yards and Docks; the other, a four-wheel drive rigid frame scraper for the Army Engineers. The drive mechanism combines a diesel electric generator set with standard Le Tourneau ac control motors and special dc drive motors at each wheel.

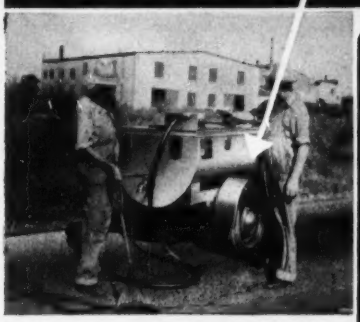
Commercial applications appear at present to be limited to auxiliary power on the rear wheels of scrapers and other units. The electric drive units have the advantage of torque converter tractors but with fewer power losses.

Another new power plant possibility is the gas turbine. But, as yet the practicability of gas turbine power for earth-moving equipment has not been proved in trials, although other applications have pointed to a promising future. Probably the most outstanding feature of the two-shaft Boeing type turbine is its ideal torque characteristics. This turbine has the ability to start and smoothly accelerate heavy loads with inherent stability of control.

Although the fuel consumption of the gas turbine is greater than contemporary gas or diesel engines, it has the ability to operate on much more lenient fuel and lubricant specifications. The gas turbine enjoys small size and lightweight characteristics to a degree unforeseeable for gasoline or diesel engines, but its high fuel consumption and high first cost are unfavorable factors.

New drives may not be necessary as diesel engines are continually being improved. Better materials, where available, have been used better to withstand the stress of higher output.

TEAM UP THIS STANDARD STEEL S-J WITH A STANDARD STEEL TAR KETTLE FOR LOW COST ROAD MAINTENANCE!



STANDARD STEEL TAR KETTLES

✔ You get three separate operations from Standard Steel Tar Kettles. (1) Hand operated spray assembly; (2) Motor operated, and (3) Gravity Draw off for bucket work. Uniform heat throughout mass of material eliminates "cold spots" or "burnt materials." Team up an "S-J" and a Standard Steel Tar Kettle and you can handle any repair work or secondary construction at less cost—less work—with less investment in equipment. Write for Catalog "TK".

STANDARD STEEL "S-J" for SECONDARY CONSTRUCTION

✔ Whether used for construction of playgrounds, driveways, parking areas, or for patching, sealing, shoulder repair or crack filling, Standard Steel "S-J" works fast—economically — efficiently.

SAVES WORK — a special "SUCK BACK" element cleans spray bar instantly after shutting off flow of material.

NO DELAYS STARTING — pump and entire piping system is instantly drained after completing a job — eliminating freezing and loss of time on *starting next job.*

SAFETY — Gravity Draw off on curb side protects operator.

Write for Catalog "S-J" for Further Details

OTHER PRODUCTS

Asphalt Pressure Distributors, Patch Rollers, Supply Tanks, Tool Heaters, Asphalt Tools, Street Flushers, Construction Brooms and Aggregate Spreaders.

SJ6

Built to the Highest Standard

Standard Steel Works NORTH KANSAS CITY, MO.

Excuse us for not telling

Auxiliary attachments, available any time, make Tournatractor year 'round money-maker

BULLDOZER, ANGLEDOZER For dozing work, Tournatractor can be equipped any time with A-frame and electric-control 2½-yd. Bulldozer, 3-yd. Angledozer, or 11'4" x 54" Root Rake.

PUSHER PLATE, PCU With all-steel pusher plate attached to standard bumper bar, Tournatractor push-loads scrapers. Double-drum electric PCU available for operating towed equipment.

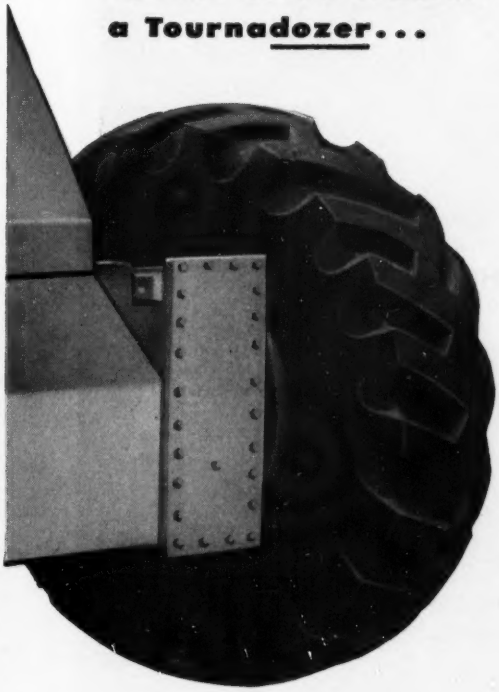
NOTE: Down-pressure attachment, blade tilt mechanism, 14-ton side-boom crane, torque converter, cab, lights also available.

LETOURNEAU EQUIPMENT

FOR 24 YEARS THE LEADER IN RUBBER-TIRED

you!

for 6 years, we've been calling our 186 hp, 19 mph rubber-tired tractor a Tournadozer...



. . . this name may have suggested application to dozer work only.

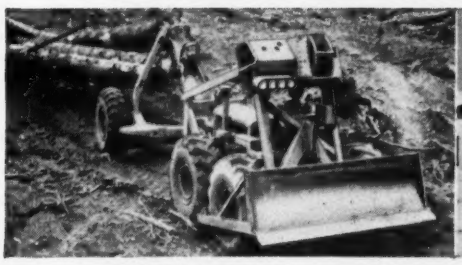
We should have told you otherwise. Actually, over the years, this unit has proved to be much more than a dozer. It's an all-purpose tool — just as effective as a pull-tractor, or a push-tractor, or a haul-tractor as it is a dozing-tractor. Its high speeds and fast maneuvering are of even greater advantage on hauling and pushing than on dozing where output requirements and range of operations are limited.

To clarify its many applications, we are re-naming the unit "Tournatractor". We are also revising our price lists to show our price for the tractor unit without the A-frame, blade, and blade controls, so that it will be directly comparable to crawler-tractor prices. On this basis, you will find you can buy a 4-wheel, high-speed, rubber-tired Tournatractor, FOB Longview, Texas, for only $18,840 (with 18.00 x 25 tires). You then can add the matched attachments you want.

This price structure is similar to that charged for any big, heavy-duty crawler-tractor, but look at the money-making advantages you get with Tournatractor:

1. **Power . . . 186 hp.**
2. **Anti-friction power flow, engine to treads.**
3. **Speeds forward — to 19 mph.**
4. **Speeds reverse — to 8 mph.**
5. **Instant speed change . . . constant-mesh transmission.**
6. **Go-anywhere, 4-wheel-drive on rubber . . . wider range of work and profit opportunity . . . no planking curbs, no trailer haul.**
7. **Electric fingertip control steer and shift . . . easier, faster maneuvering.**
8. **Giant safety air brakes . . . 2822 sq. in. on 4 wheels.**
9. **Low maintenance . . . elimination of some 500 crawler-track assembly parts that grind and wear in dirt on crawling tractors.**
10. **Easier operation, less fatigue, easier to get good operators.**

Investigate this rubber-tired tractor . . . it will do 85% of your tractor jobs *twice* as fast as a crawler. Ask your LeTourneau Distributor to arrange a demonstration and prove it on your job. Make your own comparison of production. You'll find the profits with Tournatractor too big to miss. Write or phone today.



67,000-LB. WINCH For skidding logs, pulling mired trucks, etc. Operates at 56 or 113 ft./min., in or out, while rig is in motion or stationary. Can pull from any angle up to 90°.

SNOW PLOW V-type. Mounts on same A-frame as Bulldozer or Angledozer. Has 12'4" clearing width, 6½' clearing height. 9' electric-control Snow Wing available as optional equipment.

FOR SCRAPER OPERATION Double electric PCU operates any cable-controlled scraper. For LeTourneau electric scraper, optional electric jack can replace PCU. Just "plug in" and go to work.

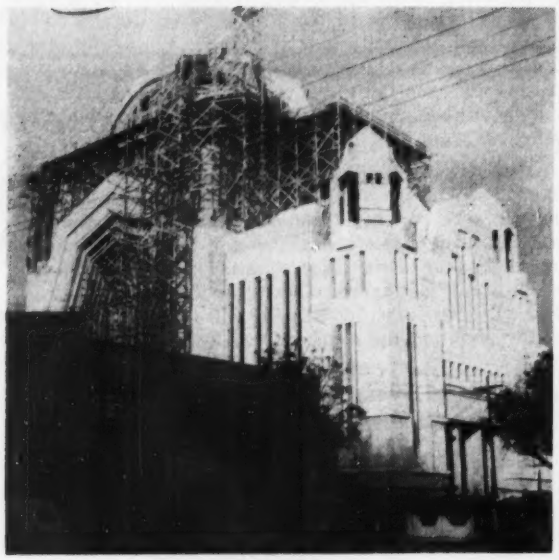
Tournatractor—Trademark Tournadozer, Angledozer—Trademark Reg. U. S. Pat. Off. T-313-G

DIRTMOVING

R. G. LeTOURNEAU, INC.

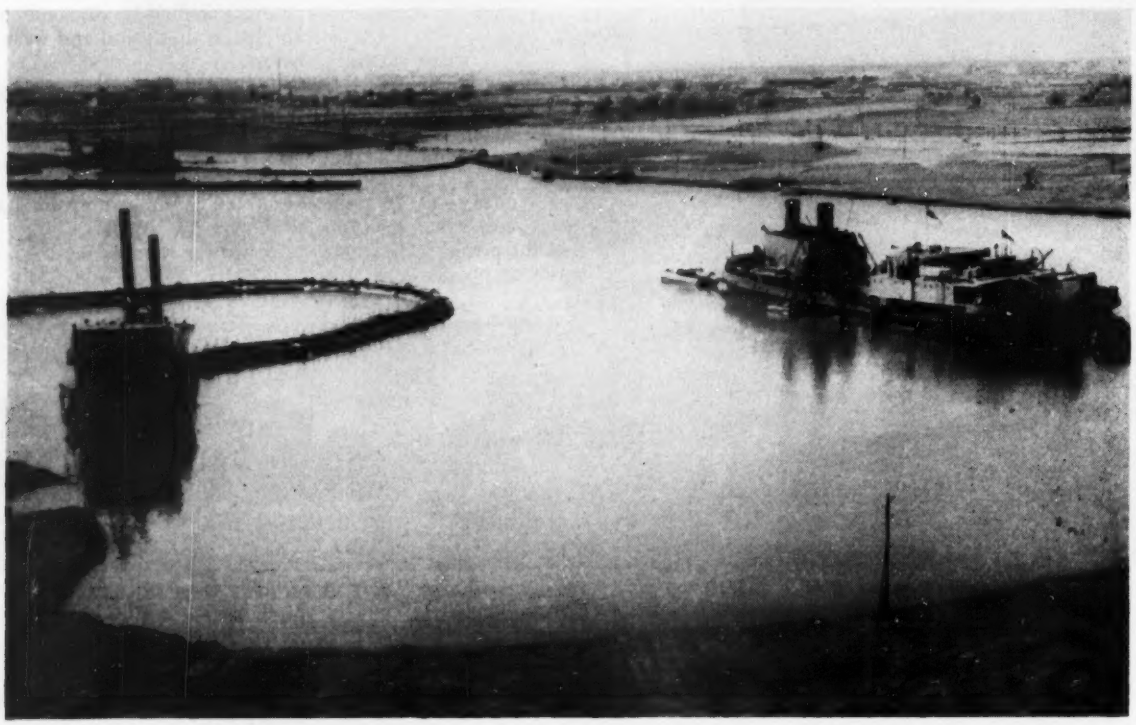
Peoria, Illinois

CONSTRUCTION 'ROUND THE WORLD



COMPLICATED FORMS—Nuestra Senora de Fatima, new church in Mexico City, is being constructed entirely of poured concrete. In spite of intricate wall design, the cost is expected to be about $400,000. Engineers hesitate to estimate the man-hours required for form building. But labor for this type of work is inexpensive in Mexico.

TAMING THE JUNGLE—This is no place for a truck crane, and crawler tractors probably would find the going tough, even if they were available, so Bailey bridging material is man-handled into place. It is part of a new road being pushed into the Serio Oilfield in British Malaya. Other construction includes pipeline laying, and building of a town.—Eastern Publishers photo



SOVIET BIG DOINGS—Three dredges work on the same project in the building of the Kakhovka hydroelectric station on the Dnieper River in the Soviet Union. Dredges are excavating for powerhouse foundations, spillways and cofferdams. Information received through the U. S. outlet of Soviet industrial news indicates that the combined efforts of all dredges working on the job are moving better than 35,000 cu yd of dirt per hr. Performance of these three is not known. This hydroelectric station is being constructed under the Communist's fifth 5-yr plan (1951-1955), which aims to increase electric power by three times within 5 yr.—Sovfoto

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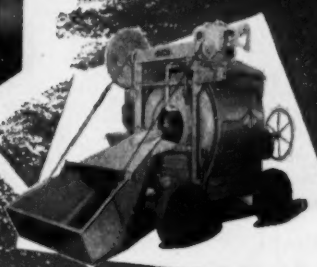
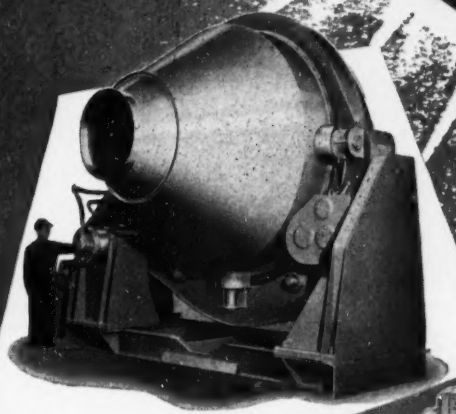
for More than Half a Century

SMITH

THE T. L. SMITH CO. MILWAUKEE, U.S.A.





Preferred by Contractors and Ready-Mix Operators, Everywhere!

When you think of concrete mixers you naturally think of SMITH. The name SMITH is held in high esteem throughout the construction industry, because SMITH has always produced the finest and most dependable concrete mixers that money can buy. Every SMITH Mixer is backed by more than 52 years of specialized engineering and manufacturing experience. And every machine is thoroughly job-tested. The familiar SMITH trademark, found on every SMITH Mixer, is therefore a symbol of quality and dependability. The next time you need stationary mixers, truck mixers or agitators, remember you can buy SMITH Mixers with confidence.

The T. L. SMITH COMPANY, 2851 N. 32nd St., Milwaukee 45, Wis., U. S. A.

Affiliated with ESSICK MANUFACTURING CO., Los Angeles, Calif.

For BIGGER and BETTER Concrete Mixers [illegible]

HOW TO HANDLE
WET JOBS

#14 of a Series

EDIFICIO MARQUÊS
do HERVEL
Rio de Janeiro, Brazil

BRAZILIAN JOB HANDLED
WITH WELLPOINT PLAN

IN THE HEART of busy Rio, digging is shown under way for basement and sub-basement of a retail establishment. The job was sizeable and posed very sizeable pre-drainage problems for one of South America's leading contractors.

• First, there were buildings or streets on all 4 sides of cut (see photo). Second, subgrade lay 27 ft down, with 21 ft of water in the way. Third, the soil was highly heterogeneous: layers of fine sand, silt and mica being sandwiched in-between hard clay strata, so that intensive piping (through the sand layers) was obviously in the cards.

• For 10 years this foreign contractor, like others, has relied on Griffin. The 2-stage wellpoint system used in this instance was designed to stabilize the soil and provide insurance against subsidence of existing structures. For "quick-dry" . . . specify . . . Griffin.

GRIFFIN
WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
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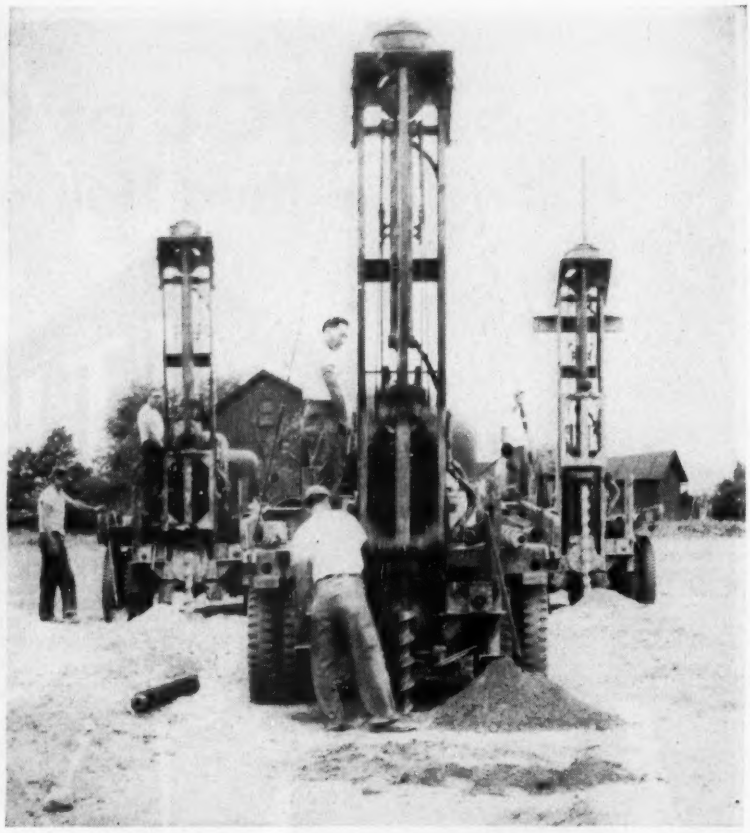
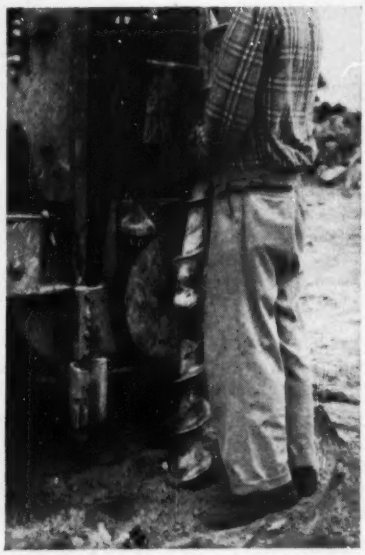


THREE VERTICAL DRILLS bore rapidly down 15 ft through sandrock for blast holes in a highway cut. These McCarthy units are mounted on 1½-ton trucks, are powered by industrial engines.

Verticals Drill Blast Holes



OPERATOR ADDS another section to the 6-in. Salem Hercules Spiral Auger. Special carbide cutting head grinds through sandrock strata.

VERTICAL AUGER DRILLS are making fast work of sinking blasting holes on U. S. Highway 62 between Youngstown, Ohio, and Sharon, Pa., which is being transformed into a modern four-lane artery. The project covers a 5-mi stretch and cuts through two areas of concentrated sandrock.

Prime contractor is D. R. Smalley and Sons, Inc., Celina, Ohio, but Apex Powder Co., Canton, is doing the blasting, with William Matthews as manager.

Three McCarthy vertical drills mounted on trucks put down about 150 holes for each blasting pattern at depths averaging 15 ft and on centers of 7 ft. Approximately 3,000 yd of sandrock and earth splits into good fragmentation each time a round is fired.

Apex uses a fixed type of explosive, detonated by Rockmaster caps with fast delay, which eliminates excessive throw and heaves the entire mass about 15 ft.

"We're through experimenting! ...Sinclair Lubricants suit us to a T"

...says Al DeFeo, Sette Engineering Co., Paramus, N. J.

Mr. DeFeo's job as Treasurer and Purchasing Agent is to see that maintenance costs on the company's heavy excavation and road building equipment are kept at their lowest figure. He reports: – "Our books give us an exact picture of how our equipment is holding up . . . About 10 years ago we experimented with different brands of lubricants, looking for one that would suit our equipment requirements to a 'T'. After trying Sinclair lubricants, *our figures proved* we finally had the right products. With Sinclair TENOL® and Sinclair LITHOLINE® Multi Purpose Grease we cut maintenance costs to a new low. Experimenting proved one thing to us – Sinclair is tops."

To cut *your* maintenance costs, try Sinclair Lubricants. Contact your local Sinclair Supplier or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

For your tough jobs

SINCLAIR LUBRICANTS

IH scores again...

NEW INTERNATIONAL TRUCKS

Proved as only IH can prove 'em

The 307 new features in the *New* International Trucks have been . . .

Proved in the world's most advanced truck Engineering Laboratory at Fort Wayne, Ind., **Proved again** on International Harvester's 4000-acre Arizona desert Proving Ground.

For profit-minded buyers. *New* International Trucks offer an unmatched combination of values—exactly the right truck for the job, unequalled performance, lowest maintenance and operating costs, maximum driver comfort.

Built the IH way. Choose from 168 basic models in America's most complete truck line. Each model embodies engineering principles, used in International's continuing program of truck research and development, that have resulted in hundreds of exclusive International features which have meant greater profits for truck buyers.

New International Trucks are BUILT as only IH can build them, PROVED as only IH can prove them, a VALUE only IH can give you.

Now—the features you want—in America's most complete truck line

New International styling identified by the IH emblem . . . **Exactly the right power** for every job. First truck builder to offer choice of gasoline or LP gas with Underwriters' Laboratories listing in 1½-ton sizes and other models . . . **Diesel power** optional in models rated 22,000 lbs. and over . . . **Designed by drivers for drivers**—Comfo-Vision cab with one-piece Sweepsight windshield. New comfort and interior styling . . . **Steel-flex frames** proved best in the field . . . **Transmissions** to meet any operating requirement . . . **296 Wheelbases** ranging from 102 inches up . . . **Easy starting and greater fuel economy** . . . **Wide range** of axle ratios for all models . . . **Real steering comfort and control.** Sizes from ½-ton to 90,000 lbs., GVW rating. Now—See The New IH-Built, IH-Proved Internationals at your nearest International Dealer or Branch.

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International Harvester Builds McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers

Better roads mean a better America

INTERNATIONAL TRUCKS

Standard of the Highway

PROSPERITY IN THE USA: How Wealthy Are We?

Again, how prosperous *are* the people of the United States?

This is the third of a series of messages devoted to this crucially important and much-debated question. The first two messages dealt with what has been happening to our national income, both in terms of its growth and how it is divided among individuals.

This third message deals with what has been happening to the resources—factories, farms, mines, and equipment of all kinds—out of which income is created. It deals with what economists call our wealth.

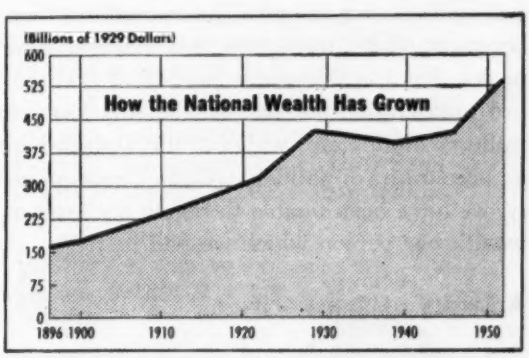
It is possible for a nation to enjoy apparent prosperity for a time by rapidly exhausting its resources. But to sustain prosperity over the long pull a nation must see that its wealth is not dissipated. Hence what is happening to our wealth now is a harbinger of what is going to happen to our prosperity later on.

How Wealth is Measured

It is often asserted that the most vital element in a nation's wealth is its people. There is a lot in this idea. For example, the full value of a country's hospital and surgical equipment depends on its physicians and their skill in handling the equipment.

However, no one has ever devised a satisfactory way to put a value on human beings. So people are omitted from calculations of national wealth. So, too, is military equipment. It is regarded as basically destructive and hence not a real addition to wealth. Otherwise, the wealth of a nation is calculated in terms of the dollar value of its physical resources.

The following chart shows the wealth of the U.S.A. at various intervals during the past 50 years. For the period through 1948 the figures come from a pioneering study by Raymond Goldsmith of the National Bureau of Economic Research, which is widely regarded as the foremost organization in its field. The figures since 1948 are estimated. To remove the effect of price changes, all of the wealth figures are calculated in 1929 prices.

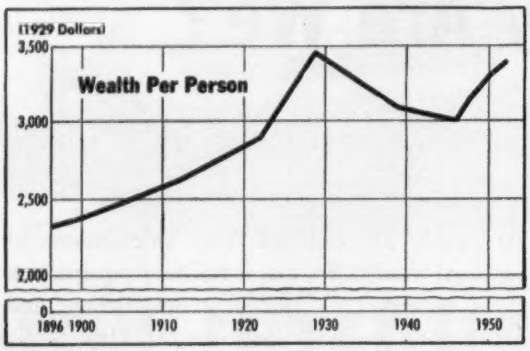


From this chart one fact stands out clearly. It is that since 1929 our national wealth has not been increasing as steadily as it did during

(Continued on next page)

earlier periods. Indeed, in 1946 our total national wealth was actually less than it was in 1929. Only in the last six years have we been able to make any consistent additions.

Even these gains are less impressive when the growth in our population is taken into account, as illustrated by the following chart.



This chart makes it clear that when the nation's wealth is divided by the population, we are slightly worse off per person today than we were in 1929. This is the case in spite of the large additions to our national wealth since 1946.

Depression and war are the two principal reasons we have made no progress in increasing our wealth per person since the 1920s. The depression brought mass unemployment and greatly reduced production which ruled out any increase in wealth. During World War II and again during the post-Korean mobilization program, U.S. production has reached new peaks. But a considerable portion of this record breaking output has been in the form of military equipment, which is not included in an accounting of national wealth. Consequently, we have been unable to regain the level of wealth per person which we had in 1929.

A Brake of Prosperity

What does this failure to raise our wealth per person mean? It means that we have fewer resources with which to create income for each individual. It means that we have made no progress in the crucial task of assuring future increases in prosperity.

As the second editorial in this series demonstrated, we have gone so far in equalizing individual incomes that "the possibilities of increasing the income of the rest of the people by 'soaking the rich' have largely disappeared." From now on the only promising way to increase our individual incomes is to increase our national earning power.

During the past four years it has taken about $3.60 of national wealth to yield $1 of income after taxes. This is a low figure for the wealth needed. Prior to World War II there were long periods when it took at least $5 of national wealth to produce $1 of national income. The experts in this field are by no means certain that it will not again take $5 rather than $3.60 of wealth to increase income by $1.

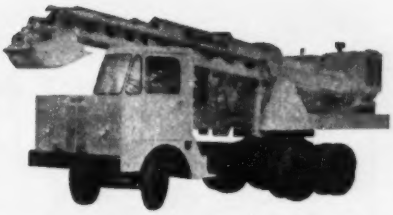
But let us assume that $3.60 of wealth will suffice to provide $1 of income in the years ahead. If by 1960—seven years from now—the income of the average American is to be increased from about $1490, where it stands at present, to $2000, we must add $310 billion to the national wealth. This is nearly three times as much as we have added to our wealth since the end of World War II, seven years ago.

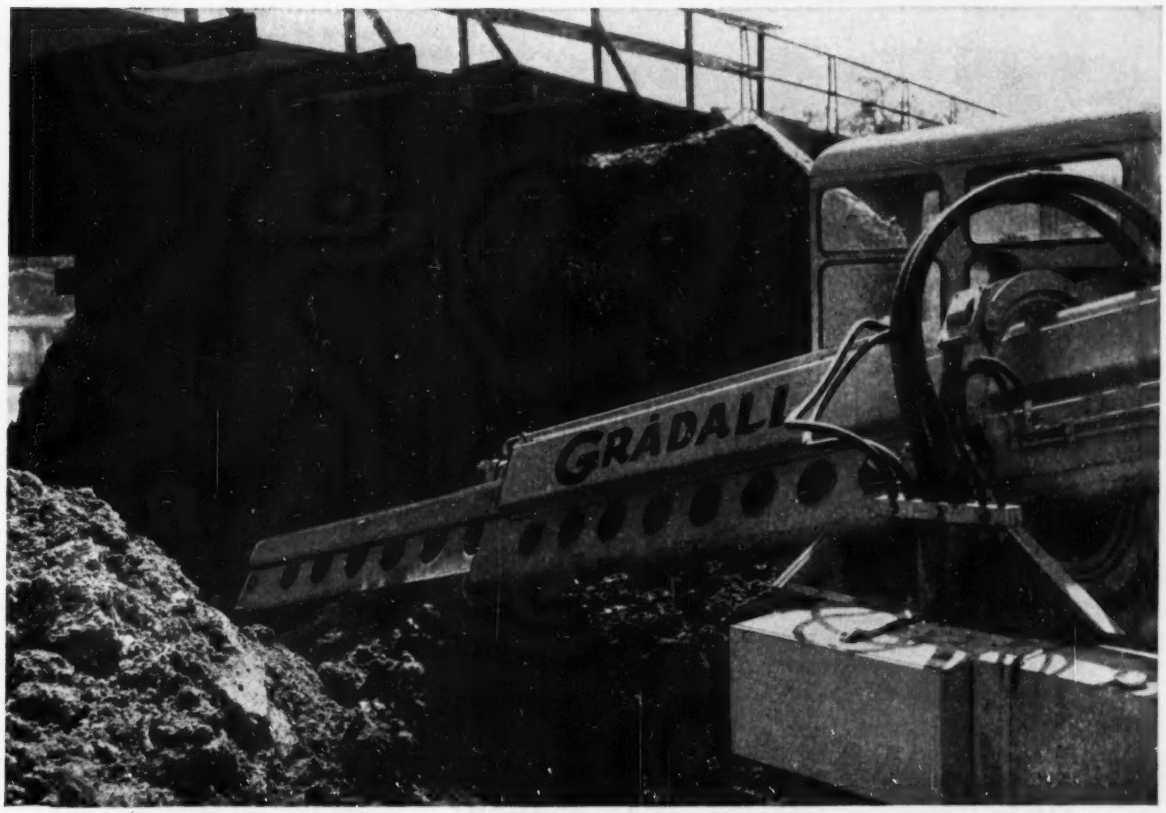
Because we have made large additions to our productive equipment in recent years, fears are frequently expressed that we shall soon be plagued by an excess of such equipment. But the facts about our national wealth do not support this conclusion. They indicate that we still have ahead of us a tremendous job of increasing our resources if the American standard of living is again to resume the steady climb which was interrupted by depression and war.

McGraw-Hill Publishing Company, Inc.

Machine with a reach!

THE MULTI-PURPOSE GRADALL





HERE'S a particularly good example of a tough excavation made easy by the Gradall. On this job, hard-to-get-at clay had to be removed from beneath a roadbed to build a pedestrian underpass. Gradall's telescoping, *arm action* boom reached far in—often horizontally—digging close to piling, completing the job *fast* and with such precision that hand labor was practically eliminated.

You've undoubtedly encountered a number of such tough jobs you could have completed faster and better with a Gradall. And if you ask any Gradall owner, he'll tell you that he keeps his Gradall *busy*—handling a wide variety of jobs such as trenching, backfilling, ditch cleaning, grading, and pavement removal. And from one job, it's ready to speed to the next, carrying its own interchangeable attachments for the work to be done.

But see the Gradall in action—see how this multi-purpose machine can cut costs and build profits for you. Your nearest Gradall Distributor will be glad to arrange a field demonstration.

Gradall
DIVISION OF WARNER & SWASEY *Cleveland*
PRECISION MACHINERY SINCE 1880

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WHO PIONEERED FULL-FLOW FILTRATION?

WINSLOW,
OF COURSE

WHO SAID IT WOULDN'T WORK?

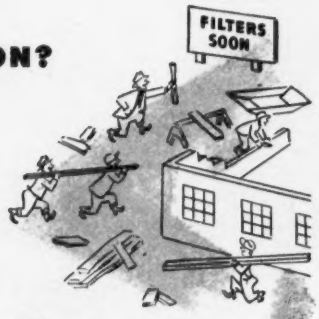
SEVERAL
COMPETITORS

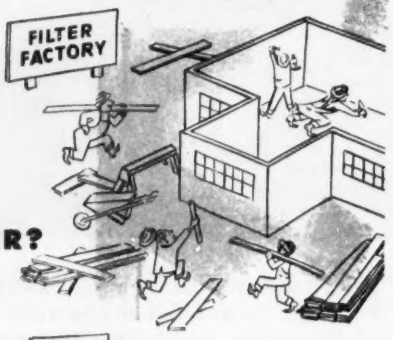
WHO IS NOW FALLING INTO LINE?

THOSE SAME
COMPETITORS

WHO IS STILL THE NATURAL LEADER?

WINSLOW, OF COURSE





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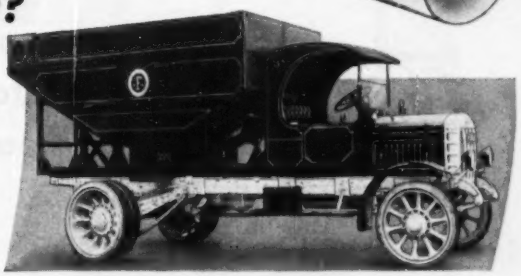
WINSLOW FILTERS

Winslow Engineering Company · **4069 Hollis Street** · **Oakland 8, California**

Can you name it?

Chain drive, solid rubber tires, spoked wheels, and fancy striping were common features on most trucks in 1918; but this old truck also sported something "new"—a specialized body with side chute discharge. This line of trucks is still produced under its original name, but is now owned by another truck manufacturer. If you can't name it, write us.



PERFECTION BODIES and HOISTS

—A Known Value!

There's never any guess-work about buying PERFECTION Bodies and Hoists.

You *know* that they are engineered with efficient application of power thrust and leverage . . . neutralization of stresses and strains . . adequate safety factors . . . and for easy installation.

You *know* that PERFECTION Bodies and Hoists are strong and durable — constructed of heavy weight materials . . . with rugged bracing and welding . . . and highest quality workmanship.

You *know* that when your choice is PERFECTION — an outstanding service record for the past 35 years backs up your judgment.

Write for literature today.

DEPT. M-23

Photo shows a PERFECTION No. 254 Dump Body of 5-yd. capacity increased to 12-yd. capacity by the addition of sideboards and top box. Equipped with a PERFECTION Isodraulic ROLL-A-LIFT.

PERFECTION TRUCK BODIES *and* HYDRAULIC HOISTS

FOR ANY TRUCK STANDARD or SPECIAL UNITS IN ALL SIZES • FOR ANY USE

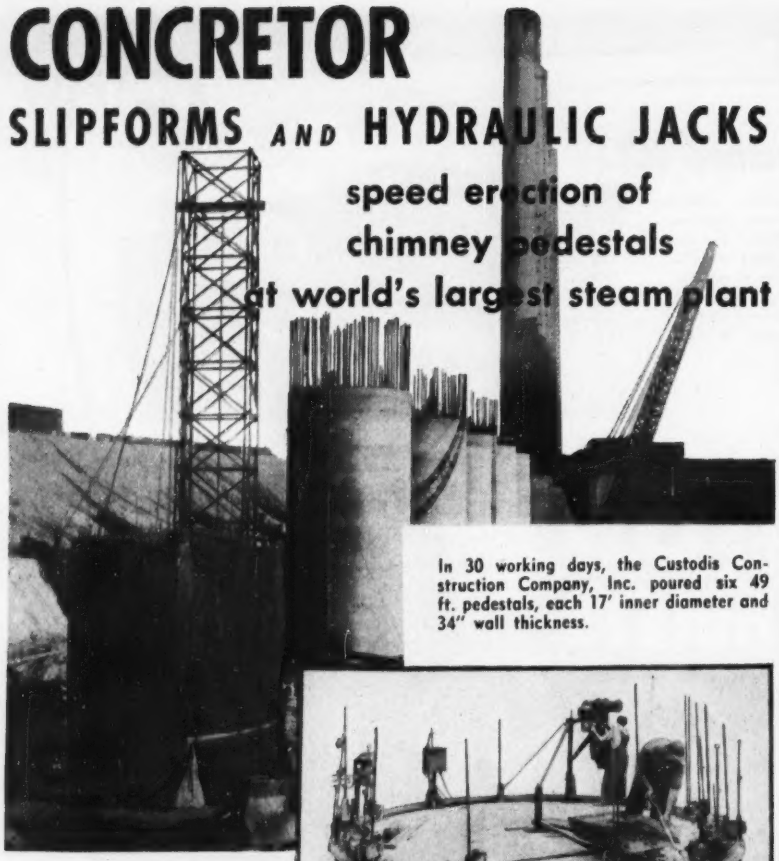
Engineered, Manufactured, and Guaranteed by

THE PERFECTION STEEL BODY COMPANY . . . . . Galion, Ohio, U. S. A.

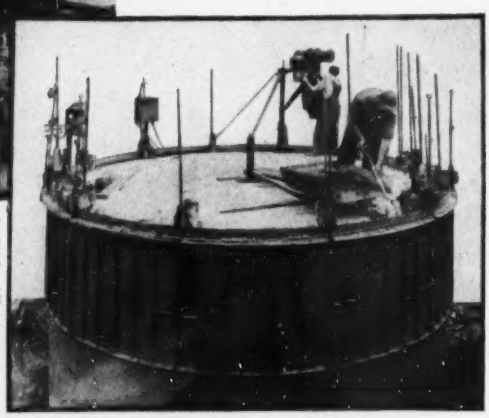
CONCRETOR

SLIPFORMS AND HYDRAULIC JACKS

speed erection of chimney pedestals at world's largest steam plant



In 30 working days, the Custodis Construction Company, Inc. poured six 49 ft. pedestals, each 17' inner diameter and 34" wall thickness.



Another job using standard machine showing the compact arrangement of pump, hoist, etc. with simple distribution of concrete on the working platform.

THE use of CONCRETOR SLIPFORMS and HYDRAULIC JACKS has saved thousands of dollars in time and labor on many types of concrete construction here and abroad. CONCRETOR STANDARD MACHINES are basically composed of a steel plate form and working platform of plywood sections with steel beam supports, whose main components are easily bolted together into a unit, suspended on hydraulic jacks. CONCRETOR STANDARD MACHINES are suitable for erection of farm silos, storage bins, towers, supporting pillars, chimneys and other structures of a horizontally circular shape with varying diameters. CONCRETOR EQUIPMENT is adaptable to ALL types of construction, using slipforms; for instance, apartment houses.

Write us . . . submit your prints . . . let us show you how CONCRETOR SLIPFORMS and HYDRAULIC JACKS can speed your concrete construction and reduce your costs.

CONCRETOR SILOS Reg. Trade Mark
U.S. AND FOREIGN PATENTS

B. M. HEEDE, INC.
80 BROAD STREET
NEW YORK 4, N. Y.

INDUSTRIAL SILOS & EQUIPMENT

SALES AND ★SERVICE★

News of manufacturers' activities designed to assist the reader in the purchase of machinery, equipment and materials and help him obtain quick service on parts and maintenance.

Distributor Appointments

Oliver Corp.: Appointment of Metalweld, Inc., as distributor for the Oliver line of industrial wheel and crawler tractors in their eastern Pennsylvania and Delaware territory, has been announced.

American Steel and Wire Div., U. S. Steel Corp.: Standard Wire & Cable Co., Los Angeles, has been named southern California distributor of electrical wire and cable.

Gustin-Bacon Mfg. Co.: Has appointed the Benjamin-Foster Co. of Philadelphia a distributor of its Ultralite and Ultrafine glass-fiber insulations in the Philadelphia area.

Cleco Div., Reed Roller Bit Co.: Four new distributors have been appointed—H. B. Bighouse Co., 972 Broad St., Newark, N. J.; Nixon Machinery Co., 1211 Demonbreun St., Nashville 4, Tenn.; Swing Machinery and Equipment Co., 110 Pendleton Ave., San Antonio 5, Tex.; and San Antonio Machine & Supply Co., P. O. Box 148 Waco, Tex.

The Insul-Mastic Corp. of America: Contracts were signed recently with three prominent coating applicators to represent this manufacturer of heavy industrial protective coatings in the South. The three companies are—Industrial Insulators, Inc., Borger, Tex.; Ozark Insulation Co., Inc., Little Rock, Ark.; and Rust-Proofing, Inc., Phoenix, Ariz.

On the Sales Front

Automatic Devices, Inc.: F. R. "Joe" Wisdom, formerly general manager of Adjustomatic Scaffold & Equipment Co., has been transferred to the parent firm and is now assistant manager on the sales staff.

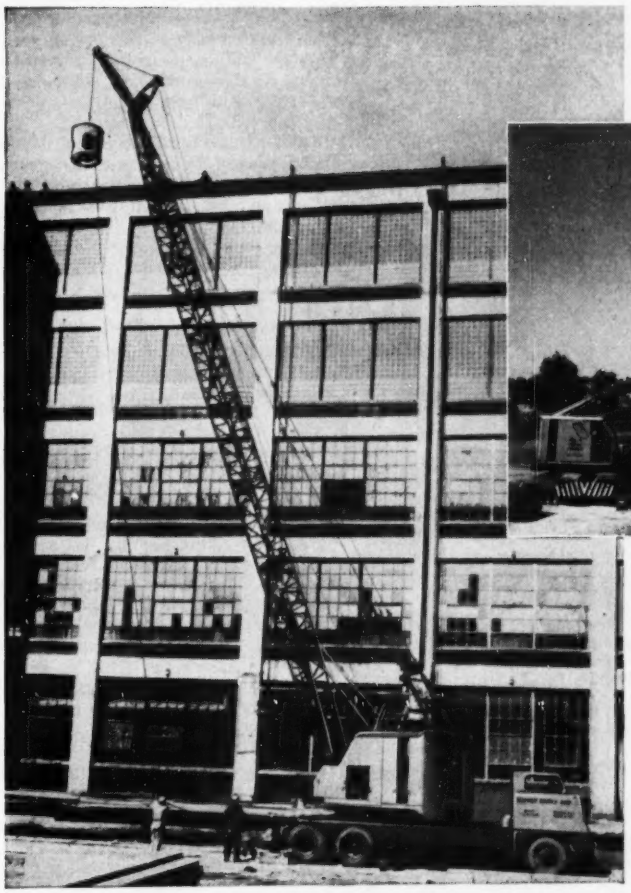
Goodyear Tire & Rubber Co.: Appointment of John J. McPeak as rim sales representative has been announced. Mr. McPeak, who was formerly manager of the merchandise sales division, will headquarter in Akron.

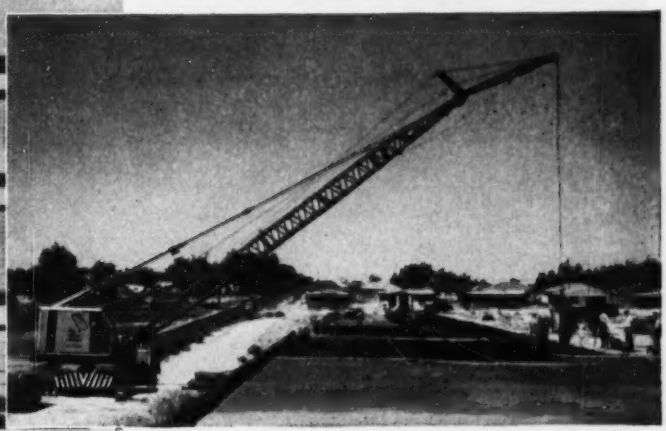
Harnischfeger Corp.: Has announced the promotion of Gordon E. Leopold to district manager of its Minneapolis office. P. H. Sackett will continue

(Continued on page 168)

All lifts are easier with a CRANEMOBILE

—for instance on placing concrete —LIFT 'EM HIGH —OR LAY 'EM OUT





Whether you are interested in placing concrete or in handling loads up to 25 tons, the flexible performance of the CraneMobile makes all lifts easier.

The CraneMobile is made in several sizes . . . will speed to scattered jobs . . . and is packed with refinements and operating advantages for handling long booms for high lifts or long reach and short booms for heavy lifts. Consider the accurate, fast, independent boom hoist which *raises or lowers boom by power only* . . . consider too, the pin-connected boom with socketed pendant cables for quick, easy boom length changes. Then there is the power load-lowering device for precision handling of heavy loads. And a collapsible hi-gantry permits lifting maximum recommended boom lengths from horizontal without other assistance.

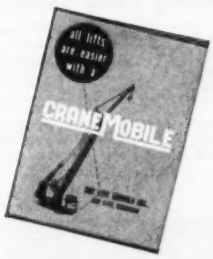
That's only part of the story. Why not get complete information from your nearest BAY CITY dealer.

212

BAY CITY SHOVELS, INC., Bay City, Mich.

WRITE FOR THIS BOOKLET

. . . just off the press. A handy pocket-sized booklet of facts and features showing why "all lifts are easier with a CraneMobile". It's yours for the asking . . . Write us.



BAY CITY

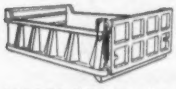
SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

prove St.Paul best!

Tear out this ad . . . use it to compare St.Paul's "bonus capacities" with any other hoist. You'll find St.Paul gives you *far more payload capacity per lb. of weight — at all body lengths!* Your truck dealer, or St.Paul distributor will also show you why St.Paul's advanced mechanical and hydraulic improvements *mean lower installation costs, added hours of smooth, trouble-free performance.* Get the complete story on these great new St.Paul dump body hoists today, or write for free illustrated folder. St.Paul Hydraulic Hoist, Customer Service Dept., 36133 Main St., Wayne, Michigan.

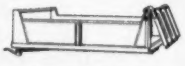
Model	Wt. lbs.	Payload tons at body lengths shown									
		7'	8'	9'	10'	11'	12'	13'	14'	15'	16'
D-16	550	7	6								
H-16	650		9								
H-18	735			8	7	6					
H-20	795			10	9	8	7				
L-20	870			12½	11	10	9	8			
L-24	1020				12	11	10	9	8		
2 H 20	1370				17½	15½	14	13	12	11	10
2 L 20	1555				22½	20	18	16	15	14	13
2 L 24	1695				27½	24½	22	20	18	17	16

...also check St.Paul's complete new line of matching dump bodies

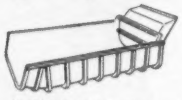


MODEL 301 Triple-strength contractor's body with pyramid side braces and boxed corner posts.

MODEL 106 Drop-side body with hinged sides and tail gate for easy hand loading with shovel.



MODEL 103 Combination dump and platform body with removable sides and corner posts.



MODEL 311 Heavy-duty rock-type body with scoop end for easy dumping of bulky loads.

OUR 41ST YEAR

5-HBC-7

St. Paul HYDRAULIC

SALES AND SERVICE . . .

Continued from page 166

in his capacity as manager of farm welder sales for the Minneapolis welder territory.

Olin Industries, Inc.: D. T. Marvel, former sales manager of the Metals Division, has been appointed vice-president for sales. C. L. Whittemore, Jr., has been appointed marketing manager.

Athey Products Corp.: The appointment of W. L. Davies as eastern district representative has been announced. Included in his territory will be Washington, D. C., Maryland and eastern Pennsylvania.

Baldwin-Lima-Hamilton Corp.: The Construction Equipment Division announces the opening of a new district office and warehouse at 1503 Northside Dr., N.W., Atlanta, Ga., replacing the office-warehouse at Memphis, Tenn. Fred L. Maus will continue as district manager of the territory.

Borg-Warner Corp.: J. C. (Jack) Kuhn has been appointed vice-president, sales, of the Atkins Saw Division.

Johns-Manville Corp.: Announced the appointment of Alexander J. Bette, staff manager of Industrial Frictions, as product manager for Friction Materials.

Champion Spark Plug Co.: George M. Galster has been named manager of the newly created Service Department and will handle all technical publications, as well as service inquiries from spark plug distributors in the automotive and aviation fields.

Master Vibrator Co.: Announces the appointment of Robert H. McCormick as sales manager.

General Tire & Rubber Co.: Appointment of three new divisional sales managers has been announced. Named to head the Boston division was J. W. Bogle, who recently headed the Richmond division. The new Buffalo division manager is H. B. Nelson, former manager of Truck Tire Sales for the New York division. Ori T. Lee has taken over the duties of Akron division sales manager. He was former manager of Truck Tire Sales for the Twin City division.

DeWalt, Inc.: Three new district managers have been appointed—J. H. Eigenberger, Milwaukee area; Douglas B. Beath, Des Moines area; and Jack J. Rowe, Cleveland area.

R. G. LeTourneau, Inc.: Announces the appointment of A. M. (Ben) Krider as Central sales manager,

(Continued on page 171)

Oklahoma Contractors' Report:

No Equipment Failure...
No Loss of time...
IN FIVE YEARS!

J. & H. Clark, Earth Moving Contractors in Perry, Oklahoma boast a record that any earth-moving man would be proud of . . . NO LOST TIME IN FIVE YEARS!

The Clark Brothers keep all their equipment on all their many jobs (example above) in constant operation. They write:

"We've been using Cities Service Products for the past five years, and have never had an equipment failure. What's more, our equipment is put to harder use than average equipment. We've moved as high as 4.2 yards a minute!

"Thanks to the fine Cities Service Products, we have had no loss of time. We use Cities Service Trojan Greases on our hydraulic equipment, Cities Service C-300 Oils on our diesel equipment, and Cities Service C-800 Oils on our gasolene equipment."

WHY NOT FIND OUT HOW THE COMPLETE LINE OF CITIES SERVICE FUELS AND LUBRICANTS CAN SAVE YOU TIME AND MONEY, STEP UP PRODUCTION? Call your nearest Cities Service office or write Cities Service Oil Company, Dept. B6, Sixty Wall Tower, New York City 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

March 14, 1952

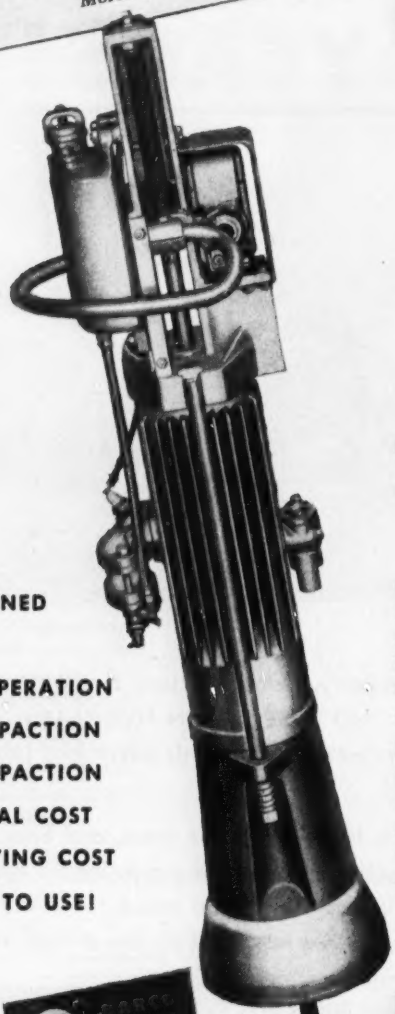
Barco Manufacturing Co.,
Chicago 40, Ill.

Gentlemen:
Probably the best recommendation that we could give you about the Barco Rammer is that we have purchased a second one and will get more as our needs increase. The specific amount of money they save us in backfill work is the total charges for auxiliary equipment with operator. This cost saving is in addition to the fact that the inspectors know the earth is being compacted better.

Ray Hartzell
Morauer & Hartzell, Inc.

Better Compaction at Lower Cost!

Says Morauer & Hartzell, Inc. CONTRACTORS, Washington, D.C.



- SELF-CONTAINED
- PORTABLE
- ONE MAN OPERATION
- FASTER COMPACTION
- BETTER COMPACTION
- LOWER INITIAL COST
- LOW OPERATING COST
- SAFE, EASY TO USE!

TALK to users of BARCO RAMMERS and you will find them agreed on two BIG points:

1. BETTER COMPACTION
2. LOWER COSTS

On job after job across the country, Barco Rammers have consistently demonstrated their ability to produce 95% to 97% compaction with lifts of 12" to 20". They have also turned in equally remarkable records for cutting soil compaction costs.

Barco Rammers are completely self-contained; no auxiliary or extra equipment required. *With a Barco Rammer, one man can do the work of five!* See for yourself — ask for a demonstration. *Send for our latest catalog and new "COST DATA" Bulletin.* BARCO MFG. CO., 1812C Winnemac Ave., Chicago 40, Illinois.

Send for Catalog No. 621:

BARCO RAMMER

FOR SOIL COMPACTION CLOSE TO WALLS, CULVERTS AND ABUTMENTS—IN TRENCHES, DITCHES

SALES AND SERVICE . . .

Continued from page 168

succeeding W. V. Richards who is joining LeTourneau distributor Great Plains Equipment Co. of Omaha as manager in charge of construction equipment sales. Taking over Mr. Krider's former position as sales representative in Canada and the U. S. is John Tuntas. John Sharda who has been serving LeTourneau as a sales engineer in the Tournarope Department, has been appointed district sales representative for Iowa, Illinois and Indiana. He succeeds R. E. Dickerson who is joining LeTourneau distributor Illinois Contractor's Equipment Co. as manager of the East Peoria, Ill., branch office.

Detroit Diesel Engine Div., General Motors Corp.: Several additions to the field organization, required to man newly created sales zones, have been announced. C. J. Davy has been appointed sales representative of one of the new zones which includes Alabama, Georgia, and Florida. R. J. Hines, has been assigned in a similar capacity to Eastern New York, Eastern Pennsylvania, New Jersey, Maryland and Delaware. J. R. Sayward, R. T. Hair, C. J. Saurer and H. S. Pillsbury, former instructors in Detroit Diesel's mobile training schools, have been added to the field service staff.

Minneapolis - Moline Co.: Distribution of industrial tractors and engines by a newly formed MM industrial sales division has been announced. This new division handles all sales and service of industrial tractors and power units for industrial, equipment manufacturer, and oil field applications, as well as government contracts for MM industrial tractors and engines. Division personnel includes: E. A. Henry, industrial sales division manager; E. R. Raveling, industrial sales manager; R. F. Jeide, assistant industrial sales manager; and George Balch, service manager. District sales managers and their headquarters are as follows: Frank Hughes, Northwest area, Minneapolis, Minn.; Robert Osborne, Northcentral area, Chicago, Ill.; E. J. Titus, Southwest area, Kansas City, Mo.; and W. F. Bush, Pacific area, Los Angeles, Calif.

Le Roi Co.: Henry C. Osterkamp has been appointed Field Research and Development Engineer for the Construction and Mining Sales Division, and Merrill Sedgwick has been promoted to the position of manager, Tractair Sales. James B. Harwood will replace Mr. Sedgwick in the Michigan, Ohio and western Pennsylvania district.

Griffin Wellpoint Corp.: Announces the following in connection with its regional setup—A Houston, Tex., division has been opened under the

4-Cycle Air-Cooled

KOHLER ENGINES

Power for garden tractors, mowers, pumps, sprayers, snow removal equipment, elevators and hoists, portable saws, concrete mixers, compressors, grinders, industrial and lift trucks, and a wide range of tools and equipment for industry, construction, farm and home.

Engineered and built to the quality standards that have won acceptance for Kohler Electric Plants the world over.

Write for information on distributor's sales franchise.

Kohler Co., Kohler, Wisconsin. Established 1873

KOHLER OF KOHLER

PLUMBING FIXTURES • HEATING EQUIPMENT • ELECTRIC PLANTS
AIR-COOLED ENGINES • PRECISION CONTROLS

LIL CHAMP
HERE YOU ARE, ROY... ANOTHER BOX OF CHAMPION BLUE DEVIL ELECTRODES JUST THE THING FOR HIGH QUALITY CONSTRUCTION WELDS... GOOD ROOT FUSION... AND WILL DEPOSIT EVEN, SMOOTH FLAT BEADS -ALSO FOR FAST...
CHAMPION
WHOA!! STOP RIGHT THERE — I KNOW ALL ABOUT THIS CHAMPION BLUE DEVIL... WENT UP TWENTY FLOORS USING CHAMPION BLUE DEVIL WITHOUT A HITCH...GOT TWO DAYS AHEAD OF SCHEDULE - AFTER ALL EVERY WELDER KNOWS...
BOSS, IT'S THIS ROD WE'RE USING — CHAMPION BLUE DEVIL NEVER IN MY LIFE HAVE I SEEN ANYTHING LIKE IT FOR SPEED... EASY HANDLING...LOW SPATTER! IT'S LIKE ADDING AN EXTRA GANG TO THIS JOB!!
... FOR DEPENDABLE WELDS ON BUILDING CONSTRUCTION WE ALWAYS STANDARDIZE ON CHAMPION!!!
GOOD VERY GOOD!!!
THE CHAMPION RIVET CO.
CLEVELAND, OHIO
East Chicago, Ind.

WINS TOUGH CONTRACTS WHERE OTHERS HAVE FAILED . . .

Oregon Transfer Company of Portland secures many jobs because of its MICHIGAN Truck Crane . . . tough jobs which other contractors have given up because of crane failures.

For example, the MICHIGAN'S superiority was responsible for a sub-contract on the new Folger Coffee Company construction in Portland. Here, in spite of poor soil conditions, the MICHIGAN got into the site easily. Working into tight corners, it kept concrete moving to the forms with no delays, resulting in the successful completion of the contract. In addition, the MICHIGAN played an important part in other construction work at the site. In the opinion of veteran crane operator C. J. Nash, an outstanding feature of the MICHIGAN is its exceptionally rugged rear axle construction.

Get *all* the facts about truck cranes and *you*, too, will select MICHIGAN . . . engineered for tough going by America's pioneer truck excavator-crane builders.

MICHIGAN POWER SHOVEL COMPANY
495 Second Street, Benton Harbor, Michigan, U.S.A.

SALES AND SERVICE . . . Continued

name of Griffin Wellpoint Corp. (Texas), located at 6100 Harvey Wilson Dr.; the name of the Jacksonville division, formerly Griffin Engineering Corp., has been changed to Griffin Wellpoint Corp. (Florida); the name of the Hammond, Ind., division, formerly Griffin Equipment Co., Inc., has been changed to Griffin Wellpoint Corp. (Indiana).

In the Main Office

The Lincoln Electric Co.: Has announced the appointment of J. S. Roscoe as executive vice-president in charge of Business Administration.

Whitney Chain Co.: Recent election of officers includes—W. H. Whitney, chairman of the Board; Richard F. V. Stanton, president and general manager; Einar A. Hanson, vice-president of Whitney Chain and Hanson-Whitney Divisions; James W. Anderson, vice-president of sales; Park C. Boyd, secretary; and B. G. Tyrell, treasurer.

American Hoist & Derrick Co.: James F. Bishop, in addition to his corporate duties of secretary-treasurer, has been appointed general manager.

Johns-Manville Corp.: The appointments of Don L. Hinmon as assistant to the general manager of the Industrial Products Division; A. J. Bette as product manager for Friction Materials; E. H. Wells as assistant to the merchandise manager; and G. R. Wahl as assistant product manager for Transite Pipe have been announced.

Stewart-Warner Corp.: William E. Judd, formerly general sales manager of the South Wind heating equipment division, has been appointed assistant to James S. Knowlson, president and board chairman.

Universal Atlas Cement Co.: The appointment of Earl R. Bryant as technical service director succeeding Homer G. Farmer, who is retiring, has been announced.

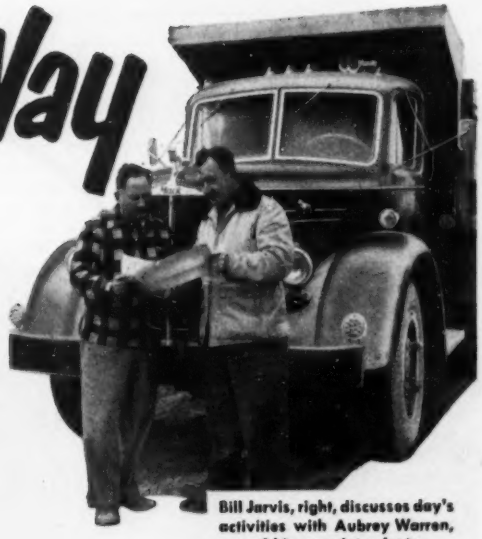
Purolator Products, Inc.: James D. Abeles has been appointed executive vice-president. He was formerly general manager of the company.

Vapor Heating Corp.: Announces the appointment of William C. Keeran as executive engineer. In this capacity he will supervise all phases of engineering, research and design of the company's products.

The Master Builders Co.: Election of S. W. Flesheim to chairman of the board and E. I. McFalls as president

(Continued on page 175)

Clearing the Way for a brand new city of 75,000



Bill Jarvis, right, discusses day's activities with Aubrey Warren, one of his superintendents.

Hub deep mud holds no terrors for Mack's six-wheel Balanced Bogie.

A completely integrated city being built from scratch . . . right from the ground up—that's Levittown, Pa., whose 16,000 homes will house a population of 75,000, making it the tenth largest city in Pennsylvania. Here will live the families of workers who will man the huge, half-billion dollar Fairless Works of the U. S. Steel Corporation.

Clearing the way for the new city now springing up is a fleet of 52 Mack trucks operated by William A. Jarvis, to whom is entrusted the tremendous task of seeing that the earth is graded, drainage canals built, and sewer, drainage and water pipe ditches dug.

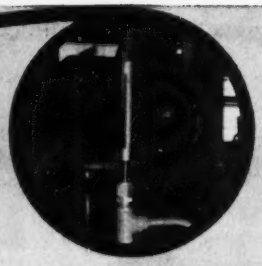
Working under floodlights at night, Bill Jarvis' Macks keep to a round-the-clock schedule, 24 hours a day, seven days a week. It is estimated that when the big job is completed, the Jarvis fleet of Macks will have dug out and hauled away a total of 2½-million cubic yards of fill, much of which will be used as aggregate in the making of concrete for the foundations of thousands of new homes.

Here again, as on so many of America's biggest and toughest earth-moving projects, Mack trucks get first call because of their proved ability to dependably move greater yardage at lower cost. As Bill Jarvis puts it: "There's nothing to beat a Mack when you've got a big, tough job on your hands."

In endless procession, Mack trucks line up alongside man-made lake to take on loads of earth scooped up from the bottom.

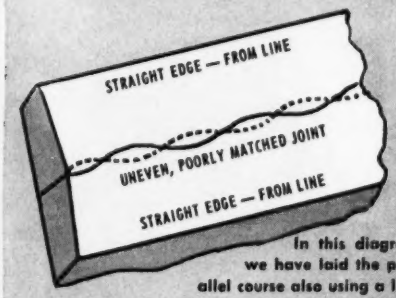
Mack Trucks, Empire State Bldg., N. Y. 1, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

Mack TRUCKS

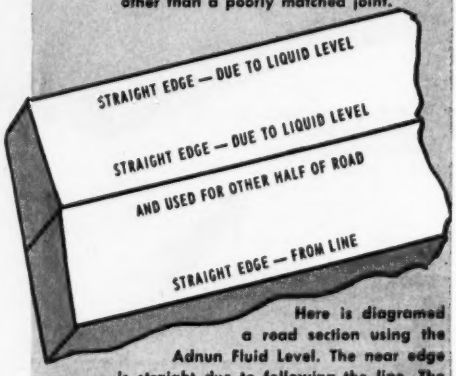


The Fluid Tells You
The Course Is Level

Here is a section of half of a road in diagram. The outside edge has been laid by using a line. The edge at the center will assume the irregularities of the subgrade.



In this diagram we have laid the parallel course also using a line at the outer edge. As the center edge will also follow irregularities of the subgrade there is no hope for anything other than a poorly matched joint.


STRAIGHT EDGE — DUE TO LIQUID LEVEL
STRAIGHT EDGE — DUE TO LIQUID LEVEL
AND USED FOR OTHER HALF OF ROAD
STRAIGHT EDGE — FROM LINE

Here is diagramed a road section using the Adnun Fluid Level. The near edge is straight due to following the line. The center joint is true and matched true and the far edge is straight due to the Fluid Level.

A job no other BLACK TOP PAVER can do!

THE increased use of asphalt on high-speed highway must tend toward better construction, greater smoothness and tighter, safer joints.

Continuous Course Correction, an Adnun feature, has always made Adnun laid roads smoother and the overlapping action of the Adnun Cutter Bar has always assured compact joints.

Now Adnun makes it possible to maintain absolute alignment of the course at the longitudinal joints with a perfect match regardless of the subgrade. The Adnun Fluid Level gives you scientific control of your road surface as it's laid. Your operator just watches the glass—the fluid tells him the course is level. The Fluid Level brings you the same ease of control as a carpenter level brings the carpenter. Study the diagrams at the right. They tell you the story.

ADNUN
TRADE MARK REGISTERED

BLACK TOP PAVER

BLAW-KNOX

BLAW-KNOX COMPANY

Foote Construction Equipment Division

1910 State Street • Nunda, New York

SALES AND SERVICES . . .

Continued from page 172

was announced. B. R. Wood was elected vice-president in charge of merchandising.

Universal Form Clamp Co.: J. Von Drasek, vice-president of the company, has been named general manager.

Marion Metal Products Co.: Gilbert E. Herr has been promoted to president and general manager. Joseph L. Halberstein was elected to chairman of the board of directors; L. E. Oberlander, secretary; R. J. Graham, treasurer; E. C. Dee and R. E. Craven, chief engineers.

Special Mention

Motorola, Inc.: Has announced the organization of a wholly owned subsidiary corporation, Motorola Communications and Electronics, Inc. The new company will distribute products manufactured by the Communications and Electronics Division of the parent corporation.

Association Activities

Western Pine Assn.: A complete new printing of the association's Standard Grading Rules has been announced. The new printing incorporates into the main body all supplemental rules adopted by the group since October 1, 1949. The association has also published a new Directory of Membership.

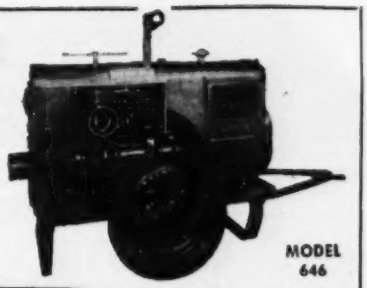
American Concrete Inst.: The 49th annual convention of the Institute will be held at the Statler Hotel, Boston, Mass., February 17-19, 1953.

Portland Cement Assn: The National Safety Council presented an honor award to the PCA for outstanding service to industrial safety at the Association's annual meeting in Chicago in November. The rate of occupational injuries in the plants of member companies of the PCA has been reduced 87% in the past 28 yr, as a result of Association-sponsored safety programs.

The Asphalt Inst.: At their annual meeting in December, the Board of Directors, representing the major part of the petroluem asphalt production industry of the U.S. and Canada, elected D. N. Myers, president of Byerlyte Corp., Cleveland, chairman of the Executive Committee, and re-elected Bernard E. Gray president. Vice-presidents elected were the following—Charles Else, The Southland Co.; P. C. Doyle, The Standard Oil Co. (Ohio); Henry G. Groves, Farmers Union Central Exchange, Inc.; D. D. Williamson, American Liberty Oil Co.; and Howard D. Webb, Envoy Petroleum Co. Herbert Spencer was re-elected secretary; George R. Christie, treasurer; and John N. Smith assistant treasurer.

IT'S HERE AT LAST!

A sure way to save money on your next wellpoint job is to get Foundation's new 4" 1000 GPM capacity pump . . . sturdy, compact, for medium and small wellpoint jobs. Why use big 6" and 8" pumping units and pay big fuel bills when you can use this efficient 4" pump, tailor-made for the job? Economical to operate and maintain . . . easy to move around.



MODEL 646

4" unit powered by 4-cyl. gas engine

RENTAL — SALES

Write for Literature

Foundation Equipment CORPORATION

Long Island City 1, N. Y. 37-11 10th St EXeter 2-1100

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"THAT'S REALLY THE WAY TO HANDLE CONCRETE"

says L. G. (Bud) Waigand, Project Manager, Peter Kiewit Sons Co.

Two men ran this Noble batch plant with 28S Koehring mixer

How would you haul and place 16,000 yards of concrete on a big water reservoir job, with pours scattered all over . . . and with a tight schedule?

Peter Kiewit picked two 3-yard Dumpcretes, mounted on light, short-wheelbase Chevrolet trucks for their U. S. Bureau of Reclamation job near Salt Lake City.

"We liked the Dumpcretes because they're fast," says Mr. Waigand, "and because they place equally well into forms, buckets or collecting hoppers. They're rugged too, and cause little downtime."

For facts on 2, 3, and 4-yard Dumpcretes write today.

MAXON DUMPCRETE

Fastest from plant to pour

Manufacturing Division
MAXON CONSTRUCTION CO., INC.
659 Talbott Bldg., Dayton 2, Ohio

Send the following

☐ "Dumpcrete High-production Method"

☐ "12 Ways to Set Up for Central Mixing"

Name_____

Firm_____

Street_____

City_____ State_____

THE ENGINEER'S REPORT

DATA

LUBRICANT: RPM Delo Oils

UNITS: Allis-Chalmers HD 20's & 19's

OPERATION: Clearing timber land for reservoir

CONDITIONS: Heavy pulling and bulldozing

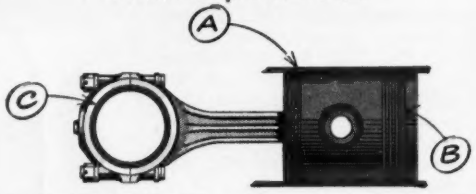
FIRM: Paul C. Helmick Co., Seattle, Wash.

No stuck rings in 14 months of unusually tough work!

CLEARING 4000 ACRES OF TIMBER LAND in 14 months is the tough job being completed by these big Allis-Chalmers diesels, owned by Paul C. Helmick Co., Seattle, on Bureau of Reclamation job at Cascade, Idaho. Yet, lubricated with RPM DELO Special Lubricating Oil, there was not a single stuck ring or bearing failure in the entire period! Timber was pulled down in 30 ft. swaths by a 130 ft. anchor chain hooked to two of the 275-h.p. HD 20's; logs were bucked into piles and burned.

ENGINE PARTS WERE KEPT CLEAN by the special ingredients of RPM DELO Oils. The representative piston, sleeve, wrist pin, and con-rod bearing shown in this unretouched photograph, indicate the minimum carbon deposits. Assembly was pulled for inspection when the A-C unit was in for check-up... and put back in service as is.

How RPM DELO Oils keep engines clean and prevent wear



A. Contain special additives that provide metal-adhesion qualities...keep oil on parts whether they are hot or cold, running or idle.

B. Anti-oxidant resists deterioration of oil and formation of lacquer...prevents ring-sticking. Detergent keeps parts clean, helps prevent scuffing.

C. Special compounds stop corrosion of bearing metal, and oil foaming in both wet and dry sump engines.

There is an RPM DELO Oil to meet every heavy-duty engine operation condition. **FREE BOOKLET** on the RPM DELO Oils gives you complete information. Write or ask for it today.

RPM DELO LUBRICATING OILS

TRADEMARK "RPM DELO" REG. U.S. PAT. OFF.

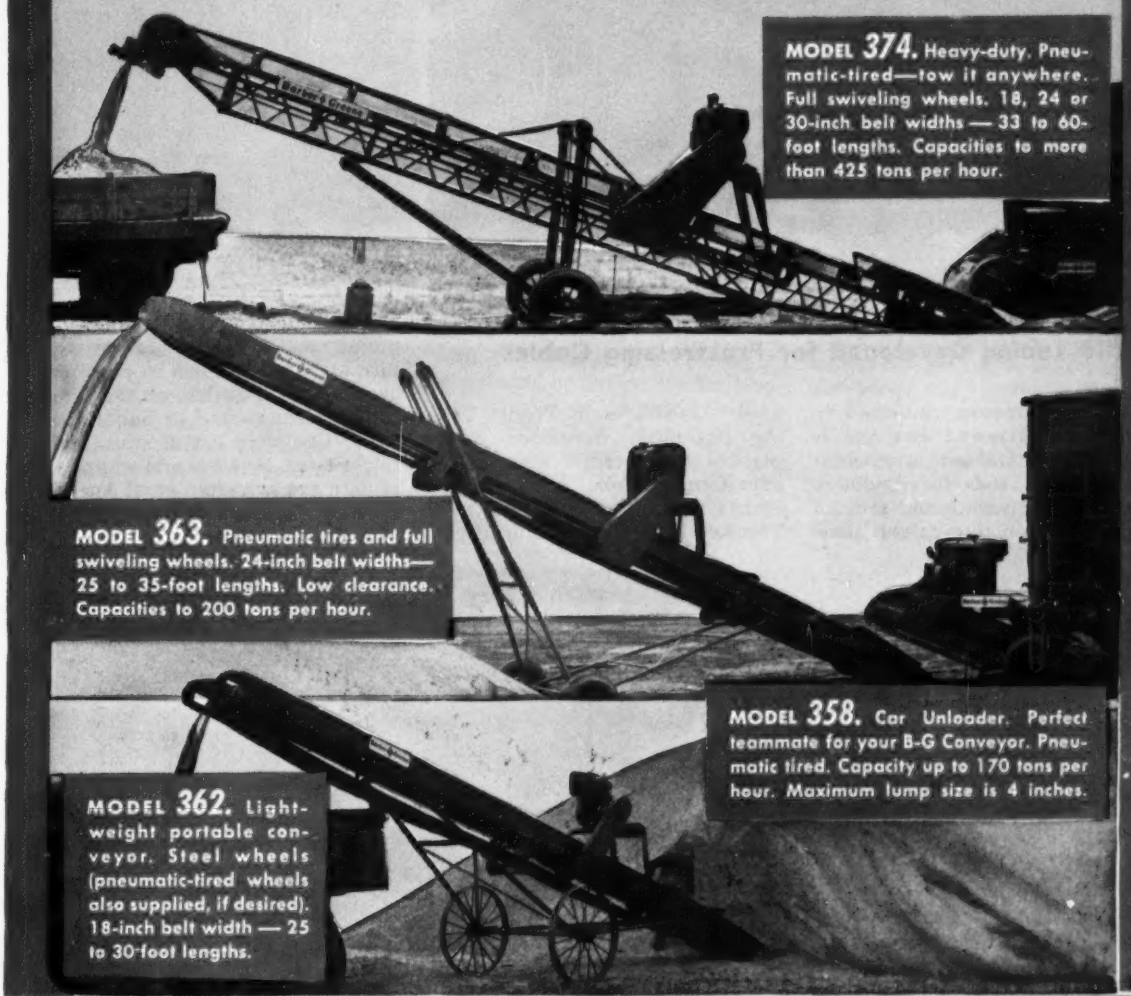
FOR MORE INFORMATION about this or other petroleum products of any kind, or the name of your nearest distributor handling them, write or call any of the companies listed below.

STANDARD OIL COMPANY OF CALIFORNIA • San Francisco 20
THE CALIFORNIA OIL COMPANY • Barber, New Jersey
STANDARD OIL COMPANY OF TEXAS • El Paso
THE CALIFORNIA COMPANY • Denver 1, Colorado

BARBER-GREENE HAS THE PORTABLE CONVEYORS YOU NEED

Here are three standard B-G Portable Conveyors together with B-G Car Unloader . . . all available for prompt delivery from your B-G distributor. These skillfully designed and ruggedly built machines will—within the limits of their capacities—provide you with the most efficient and economical method of handling sand, stone, gravel, coal, coke, ashes, wet concrete, chemicals, bags and boxes.

In addition to the models shown, Barber-Greene also builds larger capacity portable conveyors. Why not check with your B-G distributor for complete information on portable conveyors?



MODEL 374. Heavy-duty. Pneumatic-tired—tow it anywhere. Full swiveling wheels. 18, 24 or 30-inch belt widths — 33 to 60-foot lengths. Capacities to more than 425 tons per hour.

MODEL 363. Pneumatic tires and full swiveling wheels. 24-inch belt widths—25 to 35-foot lengths. Low clearance. Capacities to 200 tons per hour.

MODEL 358. Car Unloader. Perfect teammate for your B-G Conveyor. Pneumatic tired. Capacity up to 170 tons per hour. Maximum lump size is 4 inches.

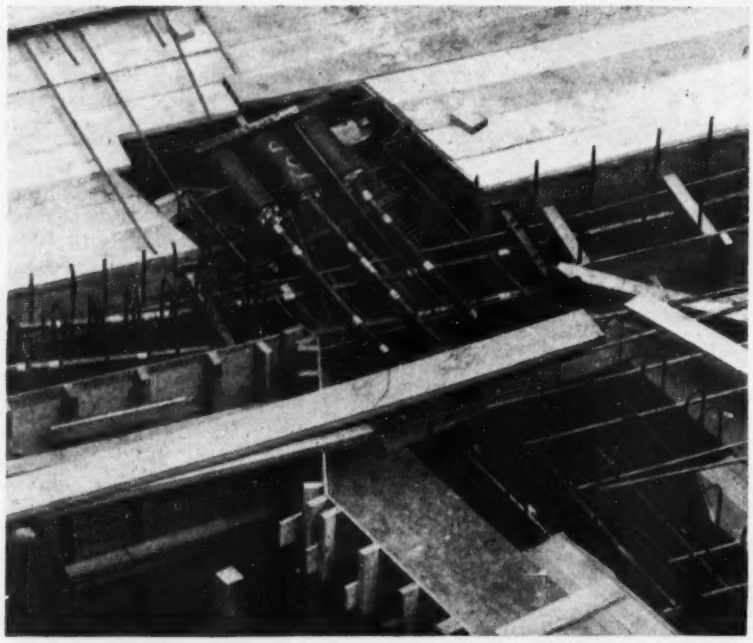
MODEL 362. Lightweight portable conveyor. Steel wheels (pneumatic-tired wheels also supplied, if desired). 18-inch belt width — 25 to 30-foot lengths.

Barber-Greene

BG

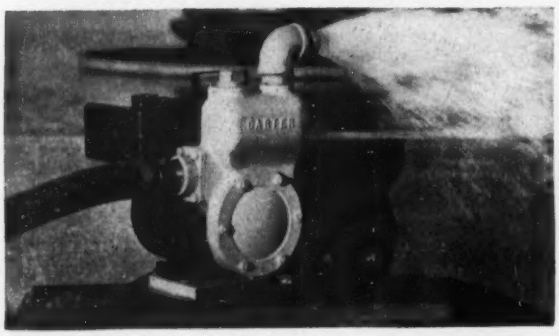
Aurora, Illinois, U. S. A.

CONSTRUCTION EQUIPMENT NEWS



Plastic Tubing Developed for Prestressing Cables

One of the problems involved in installing prestressed concrete is the protection needed on tensioning cables or rods to provide a friction-free covering and prevent adhesion of concrete at the same time. Aeroflex Split Plastic Tubing has been developed by a plastics manufacturer with the cooperation of John A. Roebling's Sons Co., wire rope specialists of Trenton, N. J. The tubing comes in 10-ft ransom lengths to fit snugly over cables of any standard diameter from ¾ in. up. Wall thicknesses vary from .030 to .040 in., depending upon diameter size. A ½-in. overlap, faced with interlocking longitudinal corrugations, combines with the natural plastics springiness to prevent any mix from seeping inside the tubing and lodging in the cable interstices. Since the tubing is unaffected by rain, ice, etc., it can be applied and left standing in a form indefinitely. The plastic will not rip or tear if struck by falling aggregate or a vibrator during a pour, according to the manufacturer. It is unaffected by chemical reactions in setting concrete. To apply the Aeroflex tubing, a workman merely opens the split with his thumb and, walking along the cable, applies it, letting it slide into place to envelop the cable. Masking tape is then quickly applied along the longitudinal split for further protection and wrapped around the tubing on 2-ft centers. In the picture at left it's shown in place on one of several girders on the Barrett & Hilp garage in San Francisco. Complete list of sizes, wall thicknesses, overlaps and additional data are available from **Anchor Plastics Co. Inc., Dept M, 36-36 36th St., Long Island City, N. Y.**



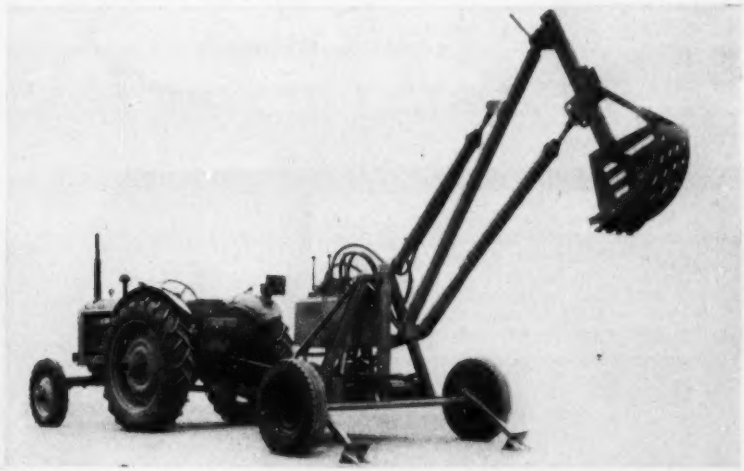
New Line of Self-Priming Centrifugals

The standard AGC pump rating for a 1½-in. centrifugal is 3000 gph, but this manufacturer rates and guarantees the 1½-in. Humdinger at 5,500 gph. It's one of the new advanced line (announced early this month in Chicago) that ranges all the way up to a 10-incher, rated at 250,000 gph. Twin coaxial volute passages offer greater capacity, faster priming and bigger trash-handling ability.—**Ralph B. Carter Co., 203 Atlantic St., Hackensack, N. J.**

Auger Attachment Joins Shawnee Line

The side delivery auger shown here is called the Cyclone, and it attaches to a Ford or Ferguson tractor in a matter of minutes. It's part of the Shawnee line and is powered by direct drive from the power takeoff. It moves up and down as an integral part of the blade and windrows snow, gravel or other loose materials neatly. The power line is equipped throughout with sealed, self-aligning ball bearings.—**Shawnee Mfg. Co, Inc., 1947 N. Topeka, Topeka, Kan.**

On-the-Job Previews of Machinery, Tools and Equipment



Hydraulic Pullshovel

The Allen Tractor-Operated Shovel (called the ATOS) is a British machine. It hooks to the drawbar of a medium-sized farm tractor or any other suitable tractor and receives power from the tractor take-off. This actuates the hydraulic pumps that work the machine which can be moved about from job to job readily. It's meeting with good acceptance throughout the United Kingdom. Weighing approximately 2,200 lb, the ATOS can cut trenches in materials up to hard clay and is interchangeable as a shovel or trench hoe for loading, as well as digging. Buckets range from 18 to 24 in., but outriggers are needed with the 24-incher. Three controls, all hydraulic, simplify operation. One actuates the bucket; another, the boom; a third, swing travel in either direction. Bypass valves cut off hydraulic power before a big stress can cause undue damage. Over-all length is 18 ft: width, 7 ft 11 in; height (with lowered boom), 5 ft 9 in. Tires are 7.50x16; hydraulic reservoir capacity, 25 gal. Hydraulic pressure for boom and bucket cylinders is 1,000 psi; for swing rams, 750 psi. Boom is 4½ in. dia; maximum loading height, 12 ft 9 in.; cutting depth, 8 ft 6 in.—**John Allen & Sons (Oxford) Inc., Cowley, Oxford, England.**

Pneumatractor Skylift

Is a man-carrying crow's nest mounted on a rotatable articulated boom, controllable either from the nest or ground level. It can handle 500 lb, lift to 37 ft.—**Schramm Inc., West Chester, Pa.**

Cook Bros. M-310 is a Specialized Dump Truck

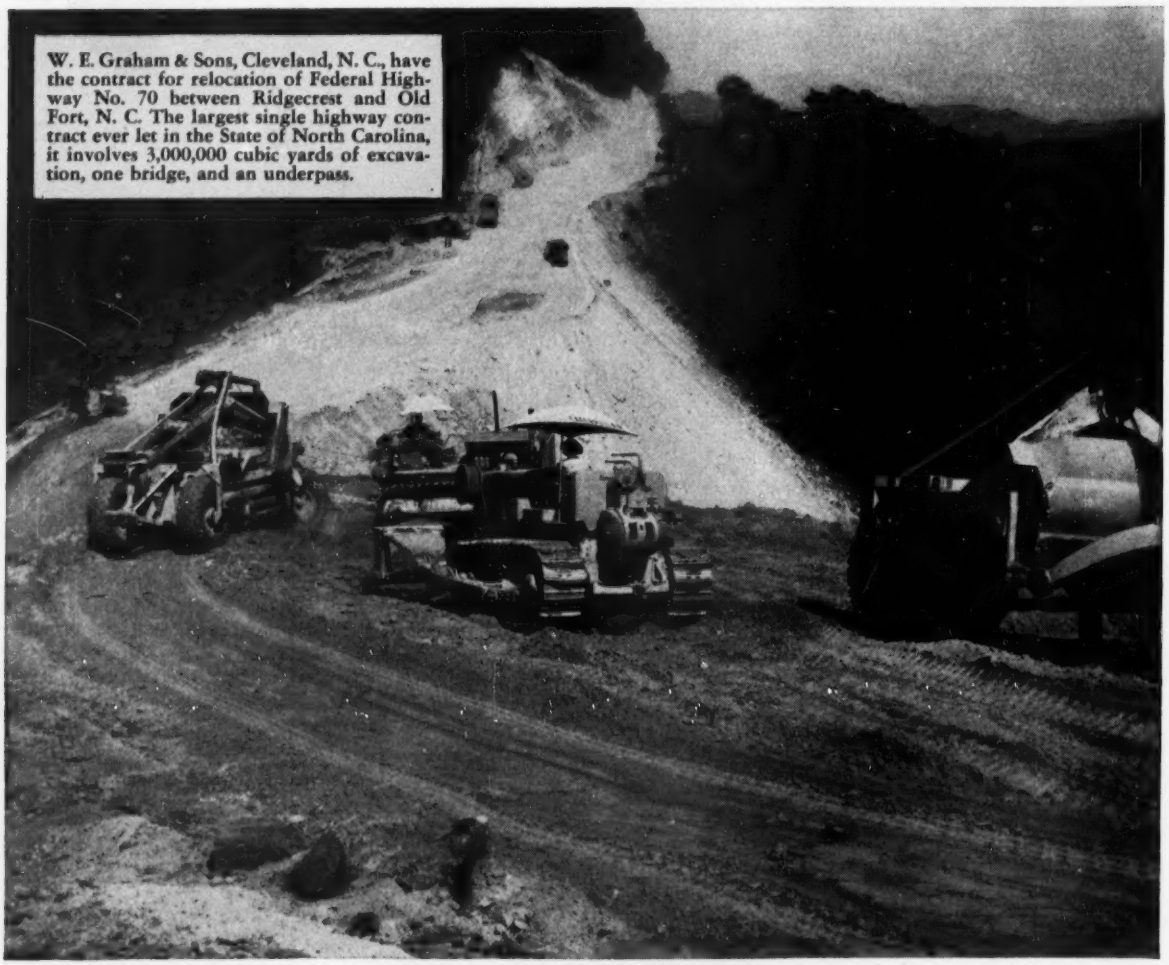
With no levers, arms or cams, but instead a set of telescoping sleeves, the hydraulic hoist on this Cook Bros. M-310 makes short work of dumping a 15-ton load. The single-passenger cab provides a completely unobstructed view and contains a hydraulically suspended seat and oversize steering wheel (with optional power steering). The one-piece steel hood opens up

(Continued on page 181)

GULF PRODUCTS *and* FINE SERVICE

keep equipment rolling

on North Carolina Highway Project



W. E. Graham & Sons, Cleveland, N. C., have the contract for relocation of Federal Highway No. 70 between Ridgecrest and Old Fort, N. C. The largest single highway contract ever let in the State of North Carolina, it involves 3,000,000 cubic yards of excavation, one bridge, and an underpass.

IT'S a speedier, more profitable job when equipment performs smoothly and dependably. And the use of quality petroleum products is one of the surest guarantees of that kind of performance.

That's why so many contractors on the big, tough jobs specify Gulf lubricants and motor fuels. They have found that Gulf lubricants provide an extra margin of protection against mechanical delays—and that Gulf fuels deliver full power. They also appreciate Gulf's prompt delivery service.

Let us discuss with you how Gulf Quality Petroleum Products can help you on your next job. Write, wire, or phone your nearest Gulf office.

GULF

to expose almost all of the Ford 317 V-8, 155-hp overhead-valve engine. Purchasers may specify dual gear drive, dual center chain drive or double-reduction axle with third axle attachment. Wheelbase is 174 in., centerline to centerline, but can be changed to meet state specifications. Total legal payload capacity has been increased by shifting some of the weight to the heavy-duty front axle. It's not a standard truck and chassis, but has been designed and engineered for contractor's dump service. Fenders are rugged, rather than pretty, as the picture attests. They're of steel plate, backed up by heavy steel beams. Photo was taken on an East Los Angeles sewer job by Garvey Constructors, San Gabriel, Calif.—**Cook Bros. Equipment Co., 1815 N. Broadway, Los Angeles, Calif.**

SAWETTE—A new chain saw unit called the Sawette is interchangeable with its forerunner, the Scythette (CM&E May '52, p 156). Powered by a 2-hp, 4,000-rpm engine, it features a steel chain sprocket drive, a 12-in. spring steel blade bar, 32-in. long chain saw. Its unique design allows a Sawette operator to cut trees and growth up to 6-in. dia, level with the ground while he remains in a standing position. It cuts under water as well, according to the manufacturer, and its weight is 26 lb. The motor is a one-cylinder, two-cycle, two-port type with a float-feed carburetor, built-in push-button dump valve and 1-qt gas tank. The Scythette attachment is recommended for cutting and trimming weeds, reeds and grass, also from a standing position. Machine is 54 in. long and has an over-the-shoulder carrying strap. — **Hoffco, Inc., Richmond, Ind.**

✓ HEIL weight-saving design lets you carry bigger loads, saves gas and tires.

✓ HEIL no-sag body construction gives you longer body-life with fewer repairs.

✓ Low mounting height makes hand loading faster and easier.

✓ Reinforced steel subframe welded integrally with the body to support the load uniformly and distribute the lifting forces of the hoist without bulging or distortion.

✓ There's a Heil distributor near you to explain every Heil Body and Hoist advantage for your specific job, and supply you with prompt, dependable service and parts. Call him today.

✓ Simplified toggle principle design eliminates unnecessary troublesome parts.

✓ Arm assembly made of structural steel welded to extra heavy reinforced tubing. Hoist frame takes all stresses without transferring any stress to truck frame.

✓ Fast-acting hoist mechanism elevates body to over 50° dumping angle within 12 seconds after raising cycle is started. Precision-engineered cylinder raises and holds loads efficiently and dependably.

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From the Beginning of Time . . .

Kern AARAU

Since the first Stone Age engineer chipped a crude flint tool . . . men have worked and strived for greater accuracy, finer precision, simpler operation.

Here in the outstanding Kern NK-3 Leveling Instrument is the final culmination of that search. Compact, lightweight . . . this masterpiece of old-world skill has been brilliantly designed with an eye to today's job . . . tomorrow's problem. It is ideally suitable for exact technical levelings, larger length leveling and for tacheometrical surveys in flat country. Amazingly simple to operate . . . the exclusive Kern design now permits BOTH the level and the leveling rod TO BE OBSERVED SIMULTANEOUSLY! Focusing, fine sighting, and fine leveling can be done with the same hand.

Truly a masterpiece of engineering design, the NK-3 will fill YOUR needs to perfection. Complete literature and specifications on request. Complete service department—factory trained persoonnel.

Kern Surveying Instrument Division

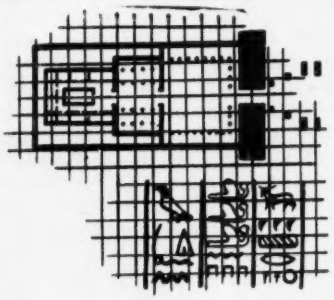
PAUL REINHART CO., INC.

70 Beaver Street, New York City

STEEL STRUCTURAL SECTIONS—Steel framing long has been associated with heavy construction, just as wood framing and studding are associated with lighter buildings. A new line of steel structural sections identified by the trademark LIGHTSTEEL, and recommended for single and multiple residences, schools, industrial and commercial structures, is now available. The sections include a complete range of studs, joists and accessories for the erection of steel building frameworks. Fabricated from strip steel by cold rolling, the sections are distinguished by a double-truss, open-web design that gives them the advantage of light weight without sacrificing strength. Single studs or joists are in the shape of a channel; welded back to back to form a double stud, they resemble an I-beam in cross-section. In addition to these two basic types, the company makes structural track and bridging that's similar in appearance. These track sections are slightly oversize so that they fit around the standard sections; bridging is slightly undersize to fit inside the flanges on standard sections. The open web simplifies passage of wiring and piping through the punched web design, and workmen can quickly fasten wires of clips directly to them for tying metal lath.—**Penn Metal Co., Inc., 205 E. 42nd St., New York 17, N. Y.**

FLOORING MATERIAL—Latex-O-crete is a new type flooring material designed to resist the destructive action of chemicals, many acids, oils, food fats, solvents and other items which cause deterioriation of floors. The product may be applied directly over an old surface at an average depth of ¼ in., and no preparation is necessary other than thorough cleaning. The material is shipped ready for application with all ingredients proportioned at the factory. It contains no asphalt or other bituminous substances and is said to withstand considerable heavy traffic from materials-handling equipment after interior or exterior application. —**United Laboratories, Inc., Cleveland, 12, Ohio**

Since the first Egyptian Pharoah



Kern AARAU

From the first Egyptian stylus to the highly precise compass of today . . . draftsmen have developed their skill, perfected their art . . . only as fast as the instruments they used would permit.

Drawing upon the knowledge of the centuries . . . bringing you the final results of over a century and a quarter of direct experience, Kern precision compasses and kits offer you an unsurpassed quality, amazing precision and matchless versatility. For any purpose, any skill, any need . . . there is a Kern precision drawing instrument or kit. Designed to fit your individual requirements . . . whether student, apprentice or skilled craftsman . . . Kern kits will introduce you to a new high in exactness, speed and performance. Kit prices from $25.00 to $100.00. Send today for free descriptive literature, catalogue on kits and individual pieces.

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4 powerful reasons why you get more of what you want in 1953 CHEVROLET Advance-Design Trucks

MORE TRUCK FOR LESS MONEY! Chevrolet trucks list for less than any others of comparable specifications. Yet they bring you features and advantages found in few other trucks. For example, the advanced Loadmaster engine—standard in 5000 and 6000 Series heavy-duty and forward-control models (optional on 4000 Series heavy-duty trucks)—now has a new high-compression ratio of 7.1 to 1, and delivers even more horsepower than before.

FACTORY MATCHED TO YOUR JOB! Every unit of the Chevrolet truck you buy is balanced to the job. Tires, axles, springs, engine, frame, body and brakes form a team carefully engineered for the greatest efficiency—and the lowest cost.

GREATER VALUE IN FEATURE AFTER FEATURE! Two great valve-in-head engines—the Thriftmaster and the Loadmaster—provide greater gasoline economy. Hypoid Rear Axle, Unit-Designed Bodies, Flexi-Mounted Cabs and many other Advance-Design features offer value unmatched by any other truck at such low cost.

MORE RUGGED THAN EVER! In 1953, Chevrolet trucks are even sturdier. Bigger, more durable brakes on many models; heavier, more rigid frames and stronger construction lengthens truck life and lowers your hauling costs. See your Chevrolet dealer. Chevrolet Division of General Motors, Detroit 2, Michigan.

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

TWO GREAT VALVE-IN-HEAD ENGINES—the Loadmaster or the Thriftmaster—to give you greater power per gallon, lower cost per load. **POWER-JET CARBURETOR**—for smooth, quick acceleration response. **DIAPHRAGM SPRING CLUTCH**—for easy-action engagement. **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **HYPOID REAR AXLE**—for dependability and long life. **TORQUE-ACTION BRAKES**—on light-duty and medium-duty models and on front of heavy-duty models. **TWIN-ACTION REAR BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—for greater holding ability on heavy-duty models. **CAB SEAT**—with double deck springs for complete riding comfort. **VENTI-PANES**—for improved cab ventilation. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—for easier handling. **UNIT-DESIGNED BODIES**—for greater load protection. **ADVANCE-DESIGN STYLING**—for increased comfort and modern appearance.

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first in demand
in value
in sales

teamwork in specialties

THE BLASTER

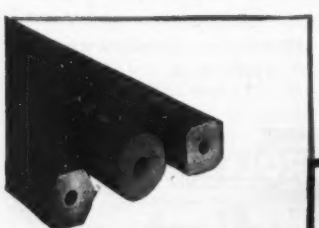
CRUCIBLE HOLLOW DRILL RODS

In rock-drilling operations, the blaster is a key man. He plans the blast, tells the drill-runners where to drill their holes, loads the charge for the greatest effectiveness.

He expects . . . and gets . . . peak efficiency from his men and the tools they use.

This is why Crucible Hollow Drill Rods rank first with crews supervised by top-notch blasters. Experience has shown them that Crucible rods stand the rapid-fire battering of modern rock-drilling longer; give them the least breakage, the greatest service life.

Crucible Hollow Drill Rods are right for the job because they are made by the world's largest producer of *tool and high speed steels.* From this metallurgical experience come the high mechanical properties that have set record after record for least cost per foot drilled. Use Crucible Hollow Drill Rods in all your drilling operations.



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52 years of Fine steelmaking

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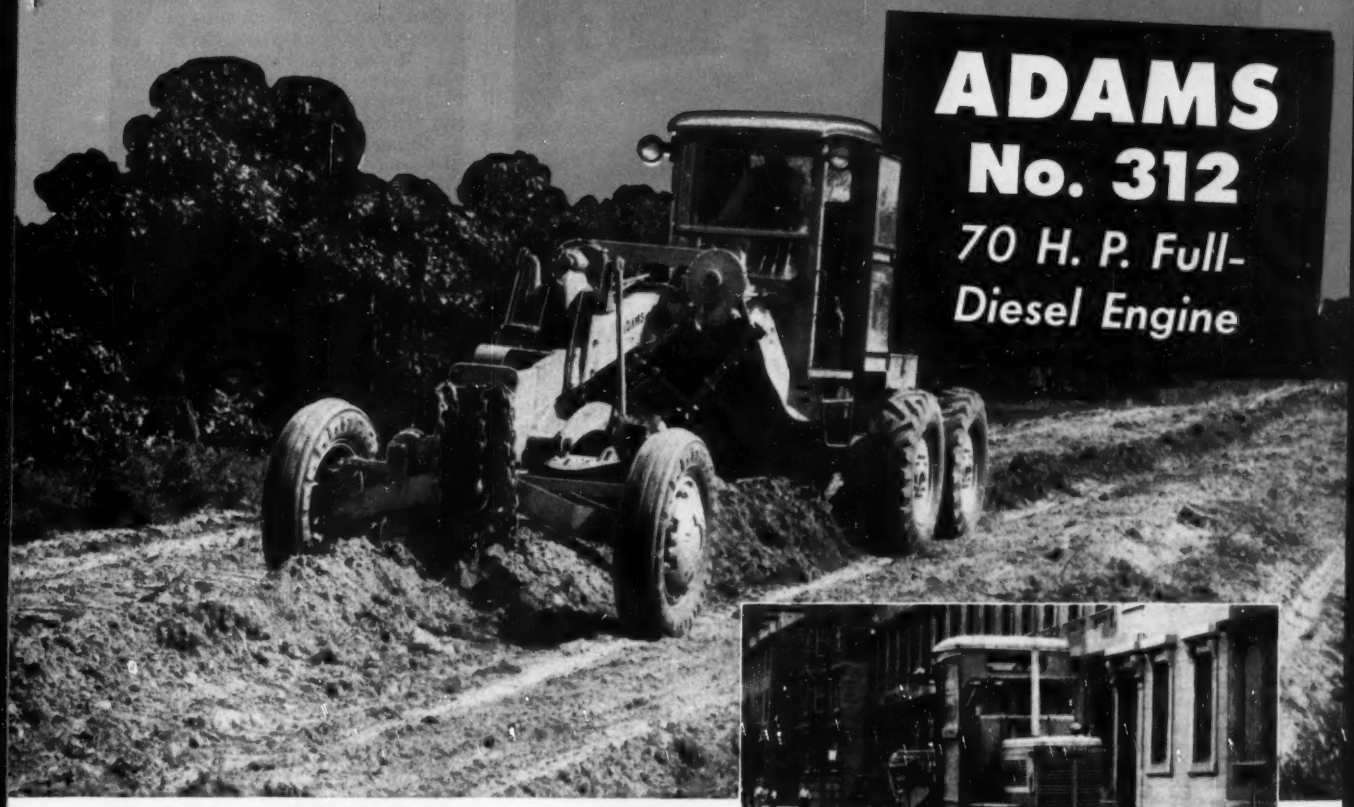
CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

REX HIGH SPEED • TOOL • REZISTAL STAINLESS • ALLOY • MACHINERY • SPECIAL PURPOSE STEELS

Looking for a Medium-Priced Motor Grader with Big Capacity? — Investigate the



ADAMS No. 312

70 H. P. Full-Diesel Engine

● If your requirements call for a motor grader with near heavy-duty weight and performance-ability—*at a moderate price*—the Adams No. 312 is made-to-order for you... Outstanding features include:

Husky Diesel Engine: Plenty of power and lugging ability—easy starting—dependable, economical.

8 Forward Speeds: 2 more than most graders. A correct speed for each operation—saves time, speeds work.

Positive Mechanical Controls: Dependable, accurate adjustments—easy, natural steering.

Wide Range of Blade Positions: Quick, easy adaptation to all kinds of work.

Big, Comfortable Cab: Roomy convenience for maximum operator efficiency—2-way adjustable seat.

Strong, Well-Balanced Construction: Machine will do much more work and last twice as long as an overworked small grader.

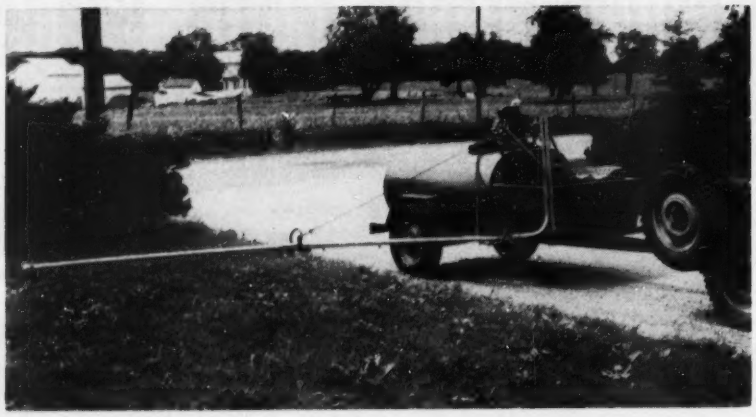
Optional Equipment: Scarifier—bulldozer—snow plow—big front tires—power steering, etc.

Let your Adams dealer demonstrate the time-saving, money-saving advantages of the No. 312.

J. D. ADAMS MANUFACTURING CO. • INDIANAPOLIS, IND.

Make your next motor grader an

ADAMS



ROADSIDE SPRAYER—About the only economical method of maintaining clean roadsides is to kill completely all brush and weeds. Spraying is being accepted as a superior method for doing the job, since it's quicker and more effective than pulling brush or cutting it. The Gledhill roadside sprayer shown (left) is a compact unit that comes in two capacities, 135 and 275 gal. It has a low-pressure system that works between 20 and 30 psi. This low pressure prevents fogging and drifting with resultant danger to adjacent crops and gardens. A 50-ft hose is attached to the unit for spraying inaccessible areas not reached by the tank and its towing vehicle. Three nozzles give ample coverage. The 135-gal model measures 108 in. long by 58 in. wide by 64 in. high. It weighs 680 lb against a weight of 890 lb for the larger, 275-gal model. This latter measures 144 in. in length and is the same as the 135 in all other dimensions.—**Gledhill Road Machinery Co., Galion, Ohio.**

LOW-COST SALAMANDER—Though similar in appearance to other salamanders, this manufacturer's oil-burning model operates far differently. A heavy iron flame spreader at the base of the stack and diagonal graduated louvers cause the flames to burn in a rapidly spinning spiral. The salamander burns diesel oil No. 1, stove or range oil, kerosene, or any light grade of fuel oil and is a distilling smokeless type. It lights with a match and will burn 10 to 20 hr on one filling of oil. Burning rate is regulated by an air-intake cap on bowl. It will produce 100,000 Btu per hr on ¾ gal of fuel oil.—**California Heater Co., 1511 E. 2nd St., Pomona, Calif.**

STEEL PILLOW BLOCKS—The result of pooling of engineering resources and bearing building experience of Dodge Mfg. Co. and the Timken Roller Bearing Co. has resulted in the development of a new line of all-steel pillow blocks which are said to provide high load-carrying capacity in a compact and rugged package. High radial and thrust capacities and the stamina to take heavy-shock loads have been provided within minimum dimensions and with far less than usual weight. The bearings are fully self-aligning, with spherical outer race, and are available in both expansion and non-expansion types. Double piston ring seals keep the lubricant in and dirt and dust out of the bearing mechanism. Bearings are sealed both on and off the shaft and are available in shaft sizes from 2 15/16 to 10 in. The Dodge-Timken all-steel pillow blocks are assembled, adjusted, lubricated and sealed at the factory. —**Dodge Mfg. Corp., Mishawaka, Ind.**

THE *Best* RULE TO FOLLOW WHEN YOU BUY A MIXER . . .

Be sure it's AGC RATED

●You know just what the performance of a Mixer will be when it's AGC RATED!

For to wear the AGC plate, portable concrete Mixers and Pavers must meet rigid specifications as to sizes and mixing capacity.

Be sure the Mixer you buy is AGC RATED!

11-S MIXER
CERTIFIED
AS BEING IN COMPLIANCE WITH A.G.C. STANDARDS BY MIXER MANUFACTURERS BUREAU
GUARANTEED TO HOLD AND PROPERLY MIX 11 CUBIC FEET OF CONCRETE PLUS 10% WHEN OPERATED IN LEVEL POSITION

Mixer Manufacturers Bureau

Affiliated with the Associated General Contractors of America, Inc.

CHAIN BELT COMPANY
Milwaukee, Wisconsin

CONSTRUCTION MACHINERY CO.
Waterloo, Iowa

THE KNICKERBOCKER CO.
Jackson, Michigan

KOEHRING COMPANY
Milwaukee, Wisconsin

THE FOOTE CO., INC.
Nunda, N. Y.

THE JAEGER MACHINE CO.
Columbus, Ohio

KWIK-MIX COMPANY
Port Washington, Wisconsin

THE T. L. SMITH COMPANY
Milwaukee, Wisconsin

WORTHINGTON CORPORATION
Construction Equipment Division
Plainfield, New Jersey

ALL-BRONZE WEATHER STRIP—Kel-eez is an all-bronze strip which attaches directly to either wood or metal frames and is held firmly in place by a special adhesive guaranteed to last indefinitely for weatherstripping of doors. No nails, screws or other fasteners are needed. A workman simply pulls the paper covering from adhesive attached to the material and presses the strip into place. A complete door is said to be weatherstripped in less than 20 min. Kel-eez consists of a flat base strip 1⅜ in. wide with rolled edges supporting a thin-gage tempered bronze insert that bows out approximately ¼ in. from the base strip. Sides of the insert work freely under the rolled edges of the base strip, and the insert spreads out when depressed. The product can be used for bottoms, as well as for tops and sides of doors. Unlike side strips, however, the bottom strip is channel-shaped and slips on to the underside of a door where it is held tightly in place by the spring tension of its upright sides. The metal strips can be cut with ordinary metal snips. The product is packaged in sets for all standard-sized doors and is available in 3- and 4-ft lengths for windows.—**Kunkel Products, Inc., 217 Ash St., Akron, Ohio**

COPPER-COATED STEEL SHEET—Many down-spouts and gutters are made from Duraclad metal copper (clad on steel), and the maker claims that it saves up to 80% over solid copper in a building. The Duraclad metal has steel sandwiched between copper sheets. This not only saves a great deal of copper, which is in short supply, but also provides the strength of steel to a product. It does not expand or contract with temperature changes as much as solid copper and, because of its ductility, can be easily worked. Other hardware items made from Duraclad metal include kick plates, light switch plates and lighting fixtures. —**American Cladmetals Co., Arch St., P. O. Box 544, Carnegie, Pa.**

GORMAN-RUPP

SELF-PRIMING CENTRIFUGAL PUMPS AROUND THE WORLD

GORMAN-RUPP BUILDS MORE SELF-PRIMING CENTRIFUGAL PUMPS FOR MORE USES THAN ANY OTHER PUMP MANUFACTURER IN THE WORLD

For every requirement and range in capacity from 1000 GPH to the big 10 inch pumping 240,000 GPH the most dependable pump is the Gorman-Rupp.

They will pump more dirty water, more hours, with less fuel, will prime quicker and at higher suction lifts than any other comparable self-priming pump. And -- Gorman-Rupp pumps are guaranteed in plain language by us and our distributors.

Contractors' Pump Bulletin 8-CP-11 furnished on request.

A Complete Line of Engine Powered and Electric Motor Driven Self-Priming and Non-Self-Priming Centrifugal Pumps.

THE GORMAN-RUPP COMPANY
MANSFIELD, OHIO

an ACCO product

TRU-LAY Preformed WIRE ROPE

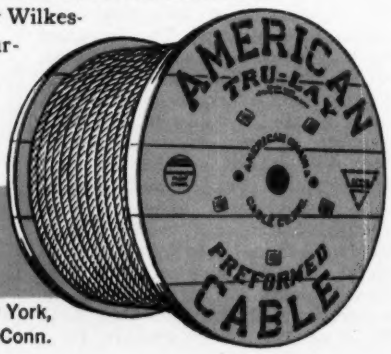
Why TRU-LAY Scraper Ropes Last Longer . . .

• Quality materials and expert manufacturing are factors in the longer life of TRU-LAY GREEN STRAND scraper ropes. But the most important thing is the grade and construction.

Sharp bends around small sheaves, abrasion from dust and dirt, shock loads—these are the things that sort the men from the boys when it comes to the life of the wire rope. If you want to hold down service costs, these are the factors to be considered when you are thinking about ordering new wire rope.

AMERICAN CABLE engineers have made unending checks of scraper ropes in service and know the best construction for the job. They designed a rope with the exactly right combination of wire sizes and core—made from improved plow steel—and *pre*formed. They put a green strand in it for quick identification.

So when you need scraper rope, or rope for any of your earthmoving equipment—specify, and get, TRU-LAY Preformed GREEN STRAND. It's the one sure way for you to get the best possible, longest lasting, most economical wire rope for each machine you operate. See your AMERICAN CABLE distributor today, or write our Wilkes-Barre office for further information.

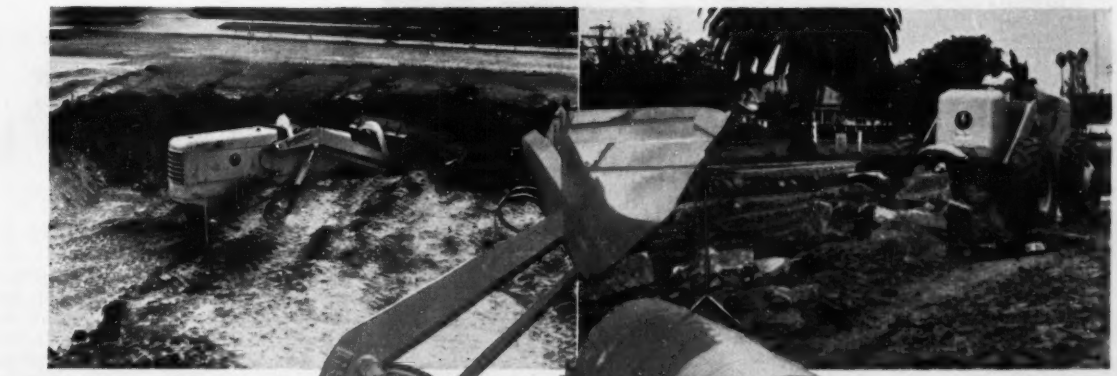


ACCO

TRADE MARK

AMERICAN CABLE DIVISION
AMERICAN CHAIN & CABLE

Wilkes-Barre, Pa., Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.



CELLARS... ...STREETS

...OR SEWERS

4-wheel-drive does a job

Amazing is the word for the variety of profitable uses contractors find for their 4-wheel-drive "PAYLOADERS." In fact, the range of uses of these versatile tractor-shovels is limited only by the ingenuity of their owners and operators.

Dig! Load! Backfill! Stockpile! Lift! Carry! Strip! Push! Pull! — all these job capabilities makes them one of the busiest machines on *any* contract — and the most in demand. They get around the job fast, too — on pavement and ground and over curbs and sidewalks without injuring them.

See one of these powerful, multi-purpose "PAYLOADERS" in action and you'll be amazed at what it can do, too. Your "PAYLOADER" Distributor is ready to give you complete facts. See him today, or write The Frank G. Hough Co., 706 Sunnyside Ave., Libertyville, Illinois.

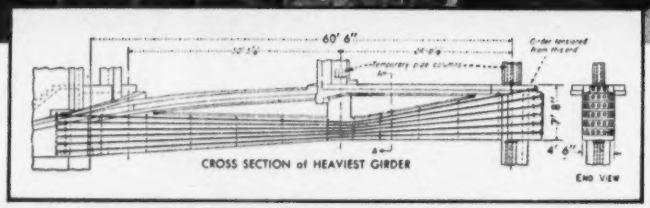
WRITE

WRITE for full information on any of the "PAYLOADER" models: Four-Wheel-drive HM — 1½ yd. and HR — 1 yd.; Rear-wheel-drive Models HY — 1¼ yd., HF — ¾ yd., HE — ½ yd.; Front-wheel-drive Model HAH — ½ cu. yd., HA — 12 cu. ft.

SAY "HUFF"

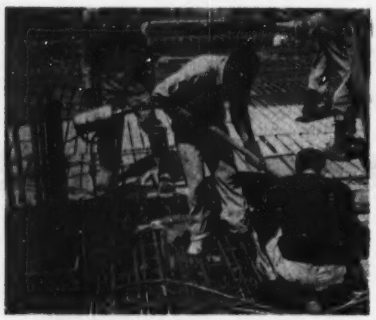
PAYLOADER®

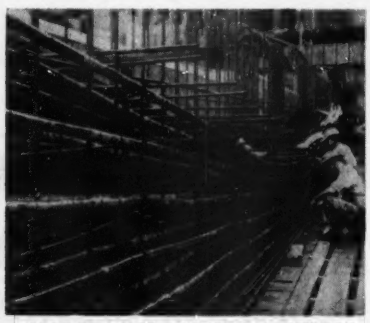
THE FRANK G. HOUGH CO. SINCE 1920



HEAVIEST PRESTRESSED CONCRETE GIRDERS VIBRATED with TWO RUBBER TIPPED VIBER VIBRATORS

"Rubber tips were essential to avoid any possible damage to protective covering on prestressing cables," says W. H. Ellison, of Ellison and King, consulting engineers on San Francisco garage built by Barrett and Hilp, general contractors.





"PROPER VIBRATION ABSOLUTELY NECESSARY in PRESTRESSED GIRDER CONSTRUCTION,"

says consulting engineer Ellison.

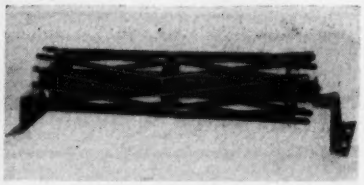
In designing the heaviest prestressed girders used thus far in the U.S. if not in the world, placement of concrete was a very critical problem. With as many as 28 1½" cables, plus normal reinforcing bars, thorough vibration was a must to insure good quality, high strength, uniform concrete throughout the entire section of the heavy girders. During placement of the concrete Viber rubber-tipped vibrators were inserted, then turned on and slowly withdrawn to minimize danger of damage to cables and covering.

RUBBER TIPS PREVENT DAMAGE to CABLE COVERING

To prevent bonding, cables were greased and wrapped with two layers of siselkraft paper. Use of rubber tipped vibrators minimized any possible damage to this covering during vibration of concrete. Such damage could have resulted in bonding with the concrete and interfered with proper tensioning of the cables.

Replaceable rubber tips are an exclusive development of VIBER Company and another example of the aggressive design and planning that has made VIBER a leader.

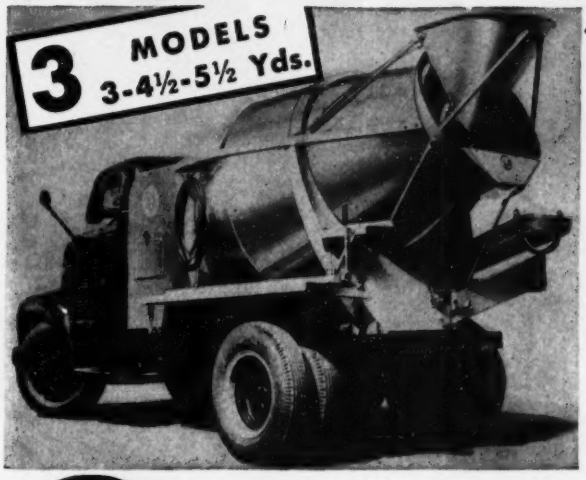
For further information on VIBER'S complete line of internal and external vibrators, write to your nearest authorized distributor or **VIBER COMPANY**, 726 South Flower Street, Burbank, California. Dept. 68



CONVEYOR RETURN ROLLS—Wet, exceedingly fine or sticky materials carried on conveyor belts often adhere to the return run and build up unevenly on bottom return rolls. This often causes a belt to weave from side to side, making contact between its edges and hangers, brackets or other structural members of the conveyor. Thus, severe tearing can occur if the situation is not checked and constant maintenance provided. To prevent build-up on these return rolls, the manufacturer offers the self-cleaning Chevron Rod return roll pictured. Because of the open design, material has almost no area on which to build up. In addition, the vibrating or slapping action of the rods helps dislodge a good deal of sticky or wet material. The manufacturer claims that the design of the Chevron Rod return roll exerts an aligning force on the belt, with easier maintained true alignment and elimination of edge wear. The new roll is a feature of Barber-Greene's Permanent Conveyor Line and is available from authorized B-G distributors.—**Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill.**

PROTECTIVE DEVICE FOR WELDING MACHINE—The LINC-THAW is a new protective device which will give an engine-driven welding machine protection from overload damage when the machine is being used to thaw frozen water pipes. No welder should be used for continuous operation above its rated capacity. The machine may overheat, causing either serious damage to the insulation or complete burn-out. The LINC-THAW hooks into the output circuit of the welder and indicates at all times what current is passing through the lines. A fuse also limits current output to the rated maximum for the generator on continuous duty. The unit can be attached directly to the frame of the machine or placed in any convenient location near by. Output leads of the machine are connected to one side and leads to the frozen water service to the other. Although the device is designed in several ratings for operation with Lincoln shield-arc engine - driven welders of 200-, 300- and 400-amp capacity, it may be used on any make or model of engine-driven welder. Two limitations: It must be used only with the proper lag-type fuse and must be used only with the size machine for which it has been rated. —**Lincoln Electric Co., Cleveland 17, Ohio**

PAYS OFF WITH BIGGER PAYLOADS



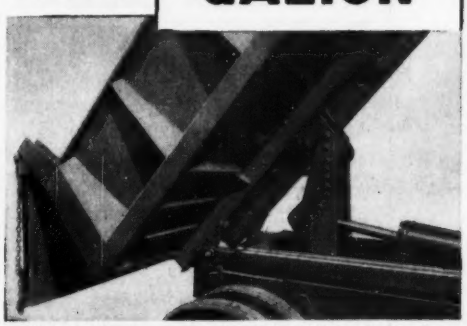
RUGGED! loaded with MONEY-MAKING FEATURES yet LOW PRICED & LIGHT WEIGHT

- Easier to handle on the road and on the job.
- Thoro-Mix action. Mixes and discharges all slumps.
- Simplest of all. No maintenance or service problems.
- Now available as 3—4½—5½ yd. mixer.

Construction Machinery Co's., Waterloo, Iowa

TRANSCRETE TRUCK MIXERS

with GALION no job is too BIG-or too TOUGH!



MODEL 880 heavy duty hydraulic hoist easily handles 10½ to 15½ ton loads

● Throughout the world, construction men depend on Galion dump bodies and hydraulic hoists to handle their toughest jobs. They like the extra years of service built into every Galion... their lower maintenance and operating costs. And, they are enthusiastic about Galion's Fulcrumatic hoist action that equalizes mechanical pressure, lifts more, easier . . . eliminates strain on truck and body.

Galion manufactures a complete line of standard and heavy duty hoists and dump bodies to meet virtually every construction need. However, if you need extra heavy duty or specialized units, Galion will be glad to design and build them for you. A-6829

This is GALION'S Fulcrumatic action

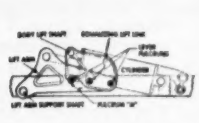


Figure 1—As the cylinder rod moves out, a powerful starting leverage is applied at Fulcrum A in a vertical direction... the body lifts smoothly and evenly.

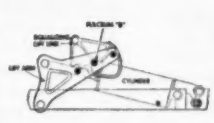


Figure 2—The body lifting effort is transferred to Fulcrum B as the rod continues outward... eliminating lift-shock and smoothing out lifting action.

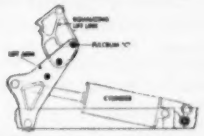


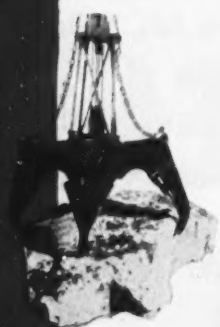
Figure 3—As the body approaches full dumping position the lifting job is transferred to Fulcrum C... maintaining uniform pump pressure and a smooth, steady dumping cycle to the very end.

MODEL 700 hydraulic hoist with Model 12-3 contractor's heavy duty body is ideal for 6½ to 8½ ton payloads

THE GALION ALLSTEEL BODY COMPANY • GALION, OHIO

OWEN

GRAPPLE GRIP *for* GREATER GRABS



To *grab* and to *hold* safely is the function of a grapple.

The Owen Grapple *alone* has independently acting tines each of which contacts the object to be lifted, regardless of its shape, and grips it with heretofore unknown tenacity. These photos tell the story.

The Owen Grapple opens *wide* to grasp *large* objects. Fast, safe operation is assured indefinitely because of the tremendous grip, scientific design and the use of the best materials available.

THE OWEN BUCKET CO.

ADDITIVE FOR DRY CHEMICALS—During the development and testing of the many dry-chemical fire extinguishers now on the market, one problem was most bothersome: Moisture coming into contact with dry powder would tend to cake it and prevent free flow. Stop-Fire, Inc. says it has the answer in its Redi-Flo model. A special additive developed by the company coats the powder particles, forming a water-resistant skin over each crystal. Called Dri-Kem, it's said not only to add to the free-flowing qualities of the chemical, but also to eliminate the need for large quantities of moisture-proofing ingredients which normally cut the fire-killing power of dry chemicals. The new Redi-Flo has a locking mechanism which prevents accidental discharge but permits instant use with a single release-squeeze motion. It carries the Underwriters' Laboratories approval and is available in 3-, 5- and 10-lb units.—**Stop-Fire, Inc., 125 Ashland Pl., Brooklyn, N. Y.**

AIRPLANE BRAKING SYSTEM—A braking principle used on airplanes has been found suitable for over-the-road vehicles. An electrical anti-skid device, developed by Goodyear, is designed to keep wheels from locking, thus avoiding out-of-control skidding and, in the case of tractor trailers, jackknifing. Numerous tests showed that the anti-skid unit will prevent pedal pressure from locking brakes, thus keeping tires rolling on smooth surfaces instead of sliding. Two electrical sensing units, each weighing about 5 lb and containing a small generator, were placed on the rear wheels of the tractor for tests. By controlling brake pressure, the electrical unit produces a "stuttering" rotation of the vehicle wheel. This stuttering effect is caused by a sensing feature which neutralizes excessive braking force by alternately releasing and re-applying the pressure controlling the gripping force of the brake drum lining.—**Goodyear Tire & Rubber Co., Akron 15, Ohio**

Here's a Big Advance in Bulldozing Performance

This bulldozing team introduces new dirt-moving ability; a new, narrower-width blade for transporting by highway; new ease of servicing and operation — all at a new low cost.

Here are some specific characteristics that make it such a productive combination for many dozing jobs:

A great tractor. This popular Allis-Chalmers HD-9 Tractor has power, weight and balance that put it in a class by itself.

A revolutionary team. Here is a tractor-dozer combination, designed as a unit, which compares in performance with conventional "dozers" weighing from five to six thousand pounds more.

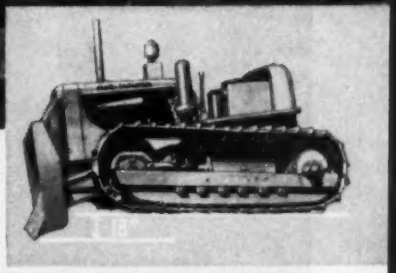
No push-beams. A completely new idea in bulldozer engineering, the Baker 9X blade is mounted directly to the HD-9 main frame. Tractor main frame and dozer are raised and lowered as a single unit.

Lighter weight — better stability. Almost 1,150 lb. lighter than standard dozer. Costs less to buy. And with lighter blade mounted 15 inches closer, tractor center of gravity is not upset. No excess wear on front truck wheels and support rollers.

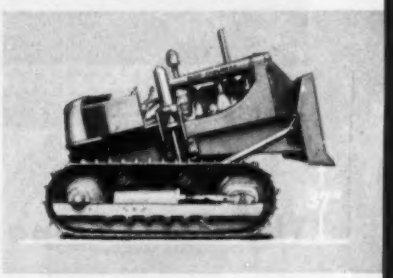
Big dirt mover. Because of extra clearance, greatly increased track oscillation and better balance, this team is a phenomenal performer in mud and tough going. And with blade fully six inches higher, capacity is kept on par with conventional blade.

Simplified servicing. 1,000-hour lubrication of truck wheels, idlers and support rollers. Dozer mounting does not interfere with engine accessibility. No removal of major tractor assemblies.

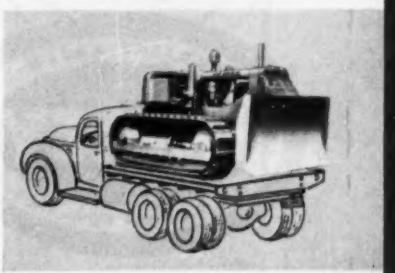
Easy to operate. Just by pulling a single lever, operator can shift from any of the six forward speeds to any of the three high-speed reverses. This, plus narrow, frame-mounted blade, makes the HD-9 particularly fast and maneuverable.



BITES DOWN HARD. Full 13-in. drop below ground, positive down pressure plus steep angle of penetration mean fast digging.



HIGH LIFT. Full 37 in. above ground. Excellent for pushing over trees and stumps and clearing brush.

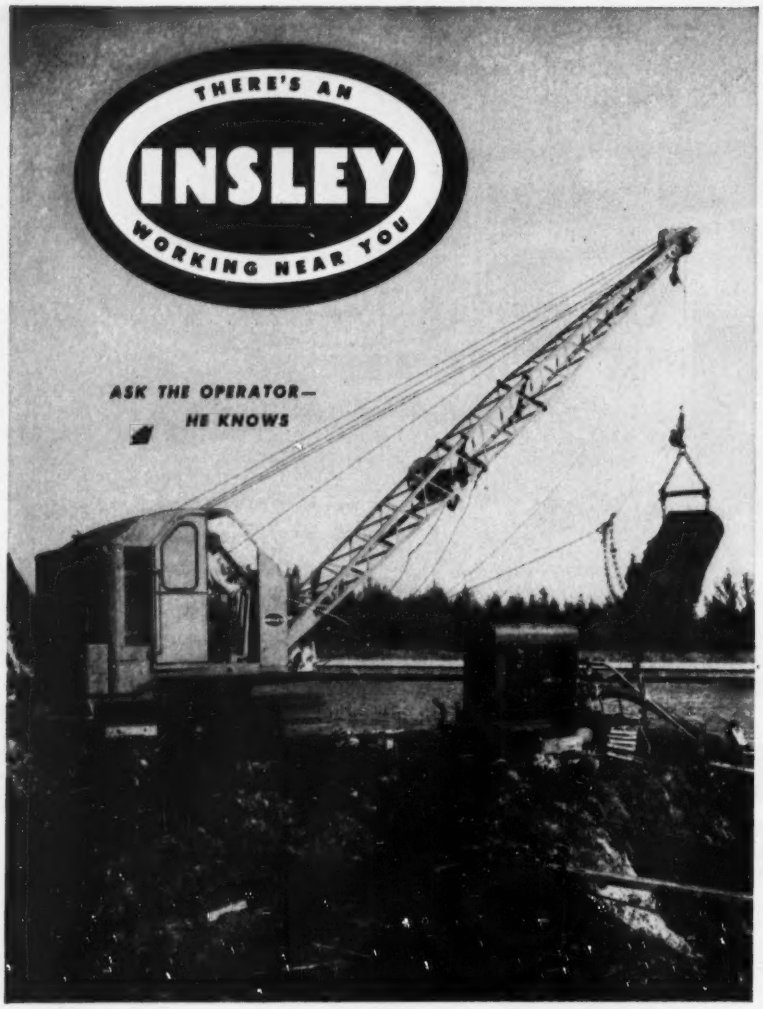


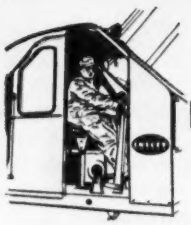
EASIER HIGHWAY TRANSPORT. Blade is only 8 ft. wide — no transport permit needed.

THE FINEST LINE ON EARTH

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

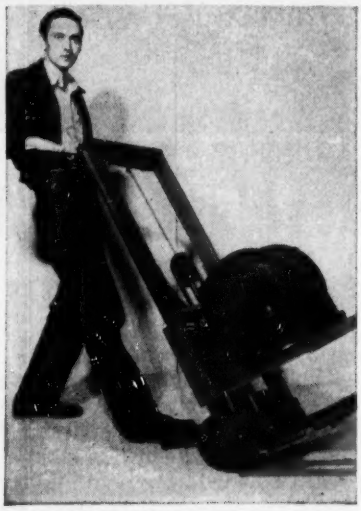


The INSLEY operator  knows..

PROJECT RATED
INSLEY
BY THE USER—FOR THE USER

that Insley Equipment can be rated-for-the-project . . . he knows that specification alternates make it possible to buy the exact equipment to do his job best.

INSLEY MANUFACTURING CORPORATION • INDIANAPOLIS 6, INDIANA



HYDRAULIC-LIFT HAND TRUCK—The photos above show how simple it is to lift and transport heavy items with the new ¼-ton capacity, one-man operated hydraulic-lift hand truck. The 440-lb electric motor was merely slid on the platform while the machine was standing erect. Three strokes of the hydraulic-jack foot pedal raised it to easy-tilt height. With the load balanced thus, it was easily transported to a work bench where jacking was continued until the movable platform height was the same as, or higher than, the work bench. At this point the motor was easily slid off. An operator can lower the Port-A-Lift platform—loaded or unloaded—at any desired speed from slow to rapid. The lever for lowering control is located on top of the frame directly in front of the tubular handle. The handle of a release valve can be returned to a closed position manually or will return automatically with the first stroke of the foot pedal for another lift. The model pictured here is J-300. Its platform

size is 14x24 in., wheel size 8x2½ in. Height is 52 in., width 24 in., and maximum elevation 36 in. The truck can be equipped with specially designed platforms or bins instead of the usual forks for individual needs. **—The Port-A-Lift Co., 2998 N. Euclid Ave., Bay City, Mich.**

MATERIAL ELEVATOR — The heavy-duty model Roll-O-Hoist material elevator has a special "walk-through" feature for handling concrete buggies. Rated at 1,200-lb capacity, the hoist is designed to accommodate a standard two-wheel buggy or can be furnished with a tip-over bucket for handling ¼ yd of concrete with each lift. Cross-braces are adjustable every 2 ft and permit a 6-ft walk-through opening to be made at any loading or unloading level on the hoist, such as the one shown in the picture. Designated as Model K, the unit consists of a rigid vertical all-steel frame mounted on two pneumatic tires and equipped with a platform 47x57 in. Power is supplied by either a 7½-hp gasoline winch or a 3-hp electric motor. A remote control mechanism enables the same operator to govern both the motor switch or engine throttle and the positive acting mechanical brake from any position on the hoist. Limit stops at top and bottom prevent the platform from over-traveling and, as demanded by many state safety codes, a cam-operated safety device secures the elevator to its upright frame in the event of cable breakage. Optional equipment is a built-in centrifugal governing brake which controls the speed of a free-falling load. Model K is ideal for handling building and roofing materials of all kinds. Basic height is 32 ft; additional height is obtained with 10-ft extension.**—Construction Machinery Sales Co., Waterloo, Iowa**

WELLMAN
easy handling of large stones

● Those big stones won't slip from the Wellman Stone Grab. Four-part closing cable reeving develops tremendous closing force on stones. Model shown has 5-ton capacity, 4½ foot jaw spread. Other capacities available.

Want Facts? Send for free descriptive bulletins.

THE WELLMAN ENGINEERING CO.
7000 CENTRAL AVENUE • CLEVELAND 4, OHIO

STONE AND WOOD GRABS • CLAMSHELL, DRAGLINE, CUSTOM-BUILT BUCKETS

"We loaded trucks without booming or moving the crane..."

Yes—now you can do things with clamshells you never did before, and do them right from the cab—with the

"Tag Master"

TOPS IN BUCKET CONTROL

No man needed at the truck to guide the bucket that's TAG MASTER controlled. With this tag line pull (UNIFORM at all levels and adjustable to any job) you can turn, spin, snub or cast your clamshell direct from the cab. You get EXACT spotting, with a light drop that adds years to bucket life. In addition, the TAG MASTER can be used as a dipper trip. Send coupon now for more details of this combination tag line winder and dipper trip—and send it now.

1. Less Booming
2. Less Swinging
3. Less Travel
4. Control of clamshell
5. Can be used as a Dipper Trip
6. Increased performance
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MORIN MFG. CO., INC. 946 Elm Street West Springfield, Mass.
Send "TAG-MASTER" details to—
Name .....
Address .....
Make—Size & Model of Machine

ON TO THE NEXT JOB

in less than two minutes...

with MILLER *Tilt-Top!*

MILLER "B" 10 ton shown above loading D-4 tractor

Time saved between jobs means more profit on every job. *One* man can load heavy units in less than two minutes. Operator drives unit on platform—it tilts, locks . . . and he's on his way with no lost motion. You'll find MILLER Tilt-Top *the* extra trailer for extra production.

MILLER Tilt-Top saves even more time than other more cumbersome trailers with its better maneuverability, and easier backing. Best of all, MILLER'S exclusive mass production of Tilt-Top trailers cuts original cost for you. Get this extra help . . . extra production now — see your MILLER dealer today!

handier

easy-to-back

priced right

Model "B" 10 ton $1175
Optional equipment (priced extra) 16' long platform (8'x14' standard), hydraulic tilt control, 2 speed hand winch and electric brakes.

MILLER Tilt-Top TRAILERS *research engineers*

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Dept. C-2, 457 So. 92nd Street, Milwaukee 14, Wis.

. . . the new separable

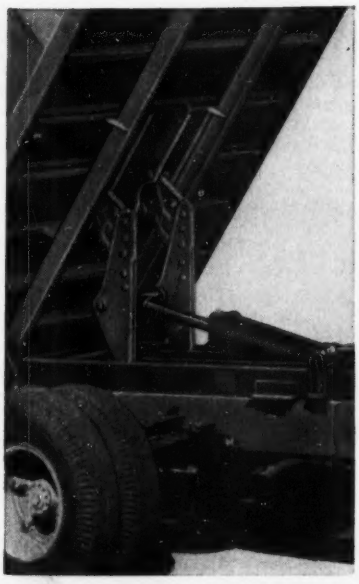
FLEXCO HINGED BELT FASTENERS

U. S. Patent No. 2,477,855

- For joining grader, trencher, ditcher and other earth moving conveyor belts.
- For belts 3/8" to 1/2" thick.
- A FLEXCO fastener that is HINGED. Has removable hinge pin.
- Troughs naturally, operates through take-up pulleys.
- Strong, durable . . . pull or tension is distributed uniformly across joint.

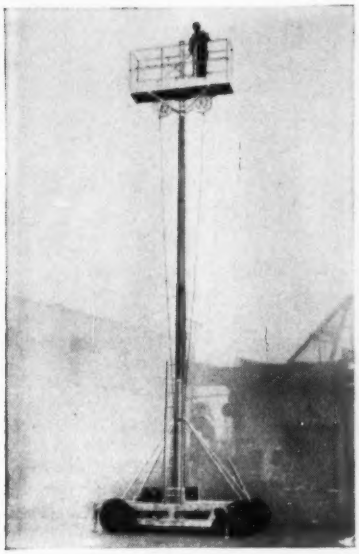
Order From Your Supply House. Ask for Bulletin HF 500.

FLEXIBLE STEEL LACING CO. 4699 Lexington St., Chicago 44, Ill.



REDESIGNED HYDRAULIC HOIST—The new Model 770 Galion hydraulic hoist pictured here has a load capacity of from 10 to 13 tons, a mounting height of only 14⅝ in., and is recommended for use on 8- to 10-ft dump bodies. The unit weighs 950 lb. It has an all-steel subframe, forged steel crosshead and rear hinges of cast steel. Fabricated steel-plate lift arms and cast-steel lift links are all equipped with bronze bushings and grease fittings. Full details and specs are available from any Galion distributor or from **The Galion Alisteel Body Co., Galion, Ohio**

HARDBOARD PANEL—One of the largest worker-owned plywood firms in the Pacific Northwest is starting volume production of its new high-strength hardboard panel called Armorboard. Although it has a high degree of shock resistance, Armorboard is so flexible that a ⅛-in. thick strip can be bent into a tight circle about the size of a hatband without cracking the surface, according to the manufacturer. Armorboard is made in ⅛-, 3/16- and ¼-in. thicknesses and has most of the physical properties of a treated board. The board's unusual resistance to impact makes it ideal for concrete forms on construction jobs. Its high flexibility is said to simplify forming problems involving sharply curved surfaces. The new board supplements other panel products of the company which include exterior and interior Douglas fir plywood in standard grades and extra long-length panels marketed under the name Armorbond. The company also makes two grades of plastic-surfaced plywood widely known as Armoron—one for concrete forms and the other for building or remanufacture where high paintability is required.—**Anacortes Veneer, Inc., Anacortes, Wash.**



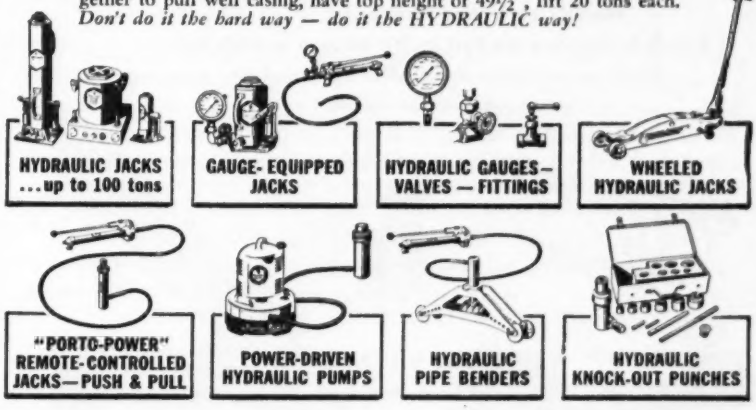
MOBILE HYDRAULIC LIFT—Although it's shown here raised to its full height of 38 ft and is supporting only one man, the Hamlin-Klock lift can retract to a 13½-ft clearance height and can support 6,000 lb. Its 8-ft platform can be rotated through 360 deg, controllable from aloft, and is recommended not only for lifting men and materials to overhead work, but also for placing trusses, tank tops, pipe sections, etc. Built on a heavy, pneumatic-tired trailer, the lift is powered by a 7½-hp Wisconsin engine that drives the telescoping hydraulic columns. The base has four stabilizing screw jacks on folding arms. These are brought into play for high lifts or heavy loads. Safety features include controlled slow rate of descent even with complete rupture of a hydraulic line. In event of a control failure, a by-pass valve facilitates lowering. A 6-in. high kickboard around the base of the platform prevents tools or materials from falling, and chest-high guard rails protect workmen from falls. Hydraulic stabilizing jacks are optional.—**Hamlin-Klock Corp., 28 N. Marengo Ave., Pasadena 1, Calif.**

LIGHTWEIGHT ROLLER—Rollpac is the name of a new lightweight power roller designed for highways and street patching, black top paving of parks and playgrounds, and for use by landscapers or school and college departments. Its features include all steel construction, formed steel channels and plates, Briggs & Stratton 5-hp engine with a Twin-Disc clutch and a Toro planetary transmission. Forward and reverse operations are controlled by a single lever which is pushed in the direction of travel desired. Hollow rolls are of 3/16-in. plate, and weight is adjustable from 720 to 1,725 lb.—**Soilaire Industries, 1200 Second Ave. S, Minneapolis 3, Minn.**

Pick the right jack for the job

...from the world's most complete line of hydraulic equipment

TWO EXTRA-HIGH-LIFT BLACKHAWK JACKS (Model EA-27), yoked together to pull well casing, have top height of 49½", lift 20 tons each. *Don't do it the hard way — do it the HYDRAULIC way!*

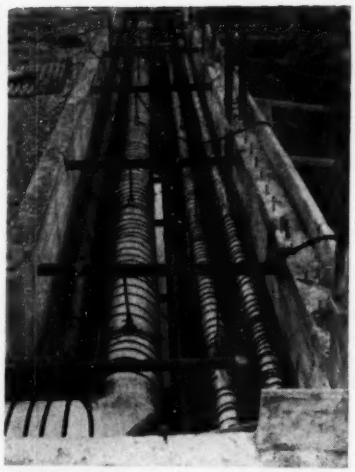


YOU GET ALL THESE HYDRAULIC TOOLS ONLY FROM BLACKHAWK

BLACKHAWK

Save buying time when you need hydraulic equipment. Specify Blackhawk—and be sure you'll get the hydraulic tool that will match your requirements exactly. Order from leading supply houses. Write for free catalogs. Products of Blackhawk Mfg. Co., Dept. J-2323, Milwaukee 1, Wisconsin.

LOADER FOR CALKING GUNS—Perhaps the most bothersome and messy aspect in connection with the use of calking guns is the method of reloading them from a shipping can with a wooden spatula. A new lever-action gun loader called the Force-Flo fits over a 50-lb, 5-gal calking pail of standard 11¼-in. dia. After it is locked into place, a calking-gun cylinder can be quickly clamped to a loading tube. The operator then works the pumping lever up and down approximately two full strokes to deliver a pound of material smoothly and solidly into the calking gun barrel. The outer surface of the gun stays free and clean from excess material, assures easier gun handling and clean hands, and eliminates the necessity of wiping cloths or costly cleaning solvents. A rubber-capped piston rod has a unique follower - lock that automatically stops the piston disk in any position, sealing the material in the container when the gun loader is not in use. This can be used to good advantage by contractors, builders and maintenance men in industrial plants, etc., to fill cylinders fast with calking, glazing, pointing and sealing compounds—in fact any viscous solutions in refinery-filled containers—**Force Flo, Inc., 6810 Euclid Ave., Cleveland, Ohio**



ULTRALITE INSULATION—Steam supply, steam return, hot and cold water pipes were all laid in place in an open concrete trench at the new Fayetteville, Ark., high school. After the joints were wiped clean and connections tightened and checked, the contractor used 1-in. thick Ultralite glass fiber insulation (faced on one side with plastic film) and tied it in place at 10-ft intervals. Next step was to take ½-in. wide Bauer and Black Polyken Tape No. 113, and, starting at one end, wind it spirally along the insulated pipe. In this manner all the pipes were thoroughly covered and protected from moisture and dampness. Angles and tees were made by cutting V's and U's in the insulation respectively at the turning point—then all joints were well sealed with the Polyken tape. On smaller pipes (under 4 in.) No. 75 Ultralite was used, since that size will flow around a small diameter more efficiently than the No. 200 type. The manufacturer claims top insulation efficiency; high utility, since the same material is used on any size pipe and on any type surface; fittings insulated as efficiently as the pipe itself.—**Gustin-Bacon Mfg. Co., Kansas City 6, Mo.**

THREE-PIECE GEAR MOTOR—A new gear motor, designed to simplify maintenance in case of electrical failure of the stator, has been announced by the General Electric Co.'s Small and Medium Motor Department. It has three parts: a G-E Tri-Clad motor, planetary gear and a mechanical adapter. It is available in speed ratings of 780 to 13.5 rpm. The mechanical adapter serves the triple function of acting as the pulley end-shield for the motor, the motor end-shield of the gear housing, and a mechanical spacer for easy accessibility to the stator frame bolts. The motor is available in ratings of 1 to 75 hp for standard and up to 200 hp for special applications.—**General Electric Co., Schenectady 5, N. Y.**

New Scruggs Vandervoort Barney department store in fashionable Clayton, Missouri. Architect: Harris Armstrong. Consulting Engineer: Neal J. Campbell. Contractor: Gamble Construction Co.

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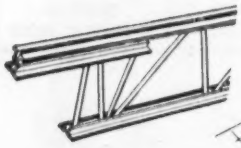
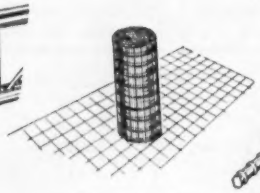
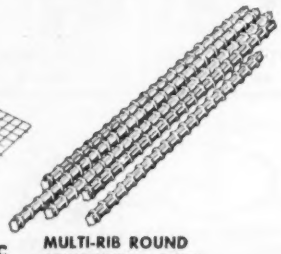
Quality controlled from open hearth to finished product in the modern Laclede Mills, these construction steels offer dependability of quality for your construction needs



STEEL JOISTS
For strong . . . lightweight . . . economical construction. Spans to 40 feet.



WELDED WIRE FABRIC
Cold drawn, welded automatically . . . in rolls or sheets.



MULTI-RIB ROUND REINFORCING BARS
With Laclede improved design for maximum anchorage . . . and numbered to meet latest ASTM A305 Specifications.

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LACLEDE STEEL COMPANY
St. Louis, Mo.

NEW EQUIPMENT BRIEFS

The Stanley **Handyman Builder's Kit** (H23) is a compact kit for hanging doors. It includes a basic H39 $\frac{3}{8}$-hp motor, router base, plane attachment and new T-H7 door and jamb butt templet. Everything fits neatly into a metal carrying case. Manufactured by **Stanley Electric Tools**, New Britain, Conn.

A universal type **snow plow wax** is announced by **Speco, Inc.,** 7308 Associate Ave., Cleveland 9, Ohio. Called SNOW-REM, it's applicable by brush or spray, is said to have unusual adhering qualities and produces an extra slippery surface that's said to increase daily plow mileage by 30%.

Latest **brick tongs** on the market are made of lightweight magnesium. They weigh only 2¼ lb, about 1/3 the weight of standard steel tongs, and can handle up to eight common brick. Grips are grooved to prevent brick slippage, and are capacity-rated by the manufacturer, **Magline, Inc.,** Pinconning, Mich.

Reardon Industries, Inc., 2837 Stanton Ave., Cincinnati, Ohio, makes **colorings that go into concrete mixes** for identifications. One application, for instance, designates concrete used to encase lines carrying petroleum, electrical conduit, etc., to prevent breakage during renovation, etc. U. S. Engineers on a dam repair job in W. Va. used color identification to gage placing of new concrete and determine its complete entry under the original structure.

Concrete floors with resiliency of oak is claimed by **Zonolite Co.,** 135 S. La Salle, Chicago, Ill. Floors consisting of vermiculite-sand concrete combine the strength of the sand with the "give" of vermiculite, a spongy, granular material used as an insulating concrete aggregate in floor construction.

Ironsides Steam Hose is the name given to a new type steam hose that combines wire braid and glass cord construction. The manufacturer is **Quaker Rubber Corp. Div., H. K. Porter Co., Inc.,** 1932 Oliver Bldg., Pittsburgh 22, Pa. The hose is flexible and kinkproof, designed for working pressures up to 200 psi, and comes in sizes from ½ to 1¼ in. I.D.

A **submersible sump pump** called the "Sub-Drainer" is available from **Jacuzzi Bros., Inc.,** Richmond, Calif. An enclosed on-off switch is sealed inside the stainless-steel, watertight motor case to guarantee automatic service. There are no separate floats or projecting liquid level controls.

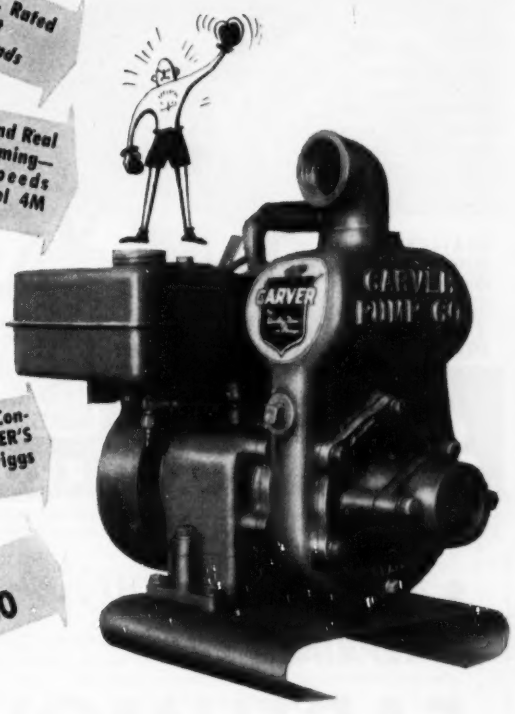
Sensationally New!

CARVER'S

1½" LIGHTWEIGHT CHAMP

The Lightest A.G.C. Rated Pump on the Market Weighs Only 55 Pounds

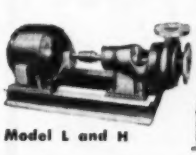
Tops in Performance and Real Economy Too. Fast Priming—Moderate Engine Speeds Fully Meet A.G.C. Model 4M Standards



Durable and Dependable Construction. Backed by CARVER'S One Year Guarantee. Briggs & Stratton 2 HP. Engine

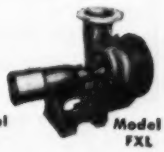
Price — Only $125.00

Advanced design and engineering skill puts CARVER far ahead of the field. Simple, compact (17" x 15" x 15") and so light one man can carry it with ease over any kind of terrain. Prime it only once—self-priming thereafter. And economical to operate too—will deliver over 30,000 gallons of water per each gallon of fuel. Self-cleaning, trash-free, open-type impeller. Trouble-free greaseless shaft seal that has been proven and reproven in the field. And many other features too numerous to mention here. Send for Bulletin No. 152. Made for electric motor and belt drive operation also. Whatever your pumping problem, see your CARVER distributor today.


Model L and H

Model WHI

Model "K"


Model FXL

CARVER PUMP COMPANY, 1402 Hershey Ave., Muscatine, Iowa

CARVER PUMPS

a SAFE Bet!

You're sure to win with these easy-wheeling Sterling barrows. Why? Because Sterlings are made to outlast any barrow on the market. Sterlings are engineered and built to take hard punishment, over a long period of years. That's why they cost less. Get the facts. Write for Catalog No. 63A.

STERLING C5W

Maximum capacity 5 cu. ft, 16 gauge tray, all-welded, no rivets, double lapped at corners. Heavy-duty malleable wheel guard.

Choice of wood handles or tubular steel frame . . . steel wheel or pneumatic tired wheel.

DEALERS: Write for Our Non-Exclusive Selling Plan.

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Look for this Mark of STERLING Quality

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New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

51 SERIES LINK-BELT SPEEDERS—The 51 Series shovel-crane manufactured by Link-Belt is available in three mountings. On crawlers it's known as the LS-51; truck-mounted, the HC-51; and wheel-mounted, the MS-51. A 4-color, 24-p catalog describes all three types with profuse illustrations, components, cutaway views and job applications. The ½-yd machine has regular "Speed-O-Matic" controls, and charts in the catalog illustrate the company's claim that this power-driven hydraulic control system can boost production by as much as 25%. Full convertibility is pointed out, including use as a shovel, dragline, clamshell, crane, trench hoe and piledriver. Other features described and illustrated well are such operating advantages as independent rapid boom hoist and independent swing and travel. **— Link-Belt Speeder Corp., 307 N. Michigan Ave., Chicago, Ill.**

INDUSTRIAL DISK BRAKES—The basic principles of Goodyear's single-disk "airplane type" brake are being applied to varied and difficult industrial braking problems. In this 8-p brochure, one typical installation is that on a high-speed band saw which has two Type I brakes, with floating disk and fixed housing. If the saw blade breaks, the saw's hydraulic system stops the machine smoothly and quickly. Numerous other applications and Types II and III brakes are described.**—The Goodyear Tire & Rubber Co., Inc., Industrial Brake Dept., Akron 16, Ohio**

ROLLING DOORS—There are nine major requirements in choosing rolling doors, according to this 32-pager, and the booklet goes along to describe how Kinnear doors meet them all. They include easy operation, space saving, durability, fire and general protection, safety, appearance, economical installation and guaranteed future maintenance and replacement service. Thoroughly explained is the extra Kinnear safety device which brings the descending door to an immediate stop and reverse if it should come into contact with some obstruction higher than the sill. Thus neither a vehicle nor workman could be injured by a descending door. Sizes range from compartment doors on mobile units to some steam plant installations where doors are five stories high.**—The Kinnear Mfg. Co., Columbus, Ohio**

ACETYLENE CYLINDERS—A detailed analysis of welded and seamless acetylene cylinders has been issued by the manufacturer. Available in bulletin form, the analysis provides concise descriptions of cylinder caps, valves, safety devices, etc., along with numerous photographs and technical drawings. Shipping weights, sizes and water and acetylene capacities are included.— **Coyne Sales Co., 200 Paul Ave., San Francisco 24, Calif.**

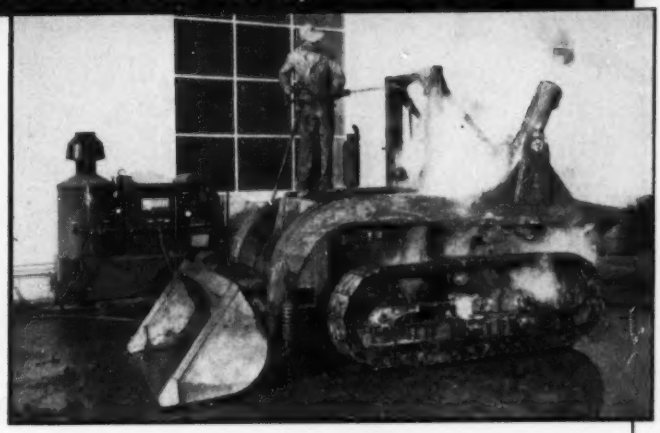
MULTIPLE V-BELTS — Thermoid's new 8-p catalog on multiple V-belts has a set of conversion tables whereby a user can determine which of the company's belts match those of several other manufacturers. Dimensions, weights, construction details are included in the catalog, as well as complete information on endless type V-belts with metal fasteners. **—Thermoid Co., Trenton, N. J.**

SAFETY TREADS—This is a 36-p reference book, pocket-size, that covers practically every type of safety stair tread application. Anyone concerned with the design, application, repair or purchase of safety treads will be greatly aided by this booklet. It has illustrated plates, cross-section drawings, typical installations and specs for Safe-Groove and Abrasive Cast Treads, as well as expansion plates, platforms, curb bars and floor grids. Various types, metals and surfaces of Ferrogrit, Alumogrit, Bronzogrit and Nicklogrit are described. — **Wooster Products, Inc., Wooster, Ohio**

STEEL DOORS AND MOVABLE PARTITIONS — Two booklets are available, one on steel doors and frames and the other on movable steel partitions. The first has 8 pp of specs and information on single-swing and double-acting doors, sliding door and frame units, fire doors and all types of engineered doors. The second, also an 8-pager, describes and illustrates flush and semi-flush type partitions, panel and industrial type, Mobilwalls, Mobilrails, Mobilscreens and wainscot for complete steel interiors. **— Virginia Metal Products Corp., 1112 First National Bank Bldg., Pittsburgh, Pa.**

PILLOW BLOCKS — Bulletin A-620 tells all about Dodge-Timken Pillow Blocks, explaining their high load-carrying capacity, compactness and ruggedness. The new line of pillow blocks is the result of pooling of engineering resources and bearing building experience of Dodge and Timken Roller Co. One page contains a table on radial load ratings for all sizes from 2 15/16 through 10 in. The back cover presents other products in the Dodge line. **— Dodge Mfg. Corp., Mishawaka, Ind.**

CLEANS TRACTOR-DOZERSHOVEL IN 2 HOURS WITH MALSBARY 300



5 Cleaning Actions, Plus Pressures To 400 Lbs., Blast Mud, Grease & Tars, Without Compound Changes

Previous cleaners took 6 hours to clean a TD9 tractor-dozershovel. Now Merrill-Brose Co., IHC dealer, Oakland, Calif., does the job in 2 hours with a MALSBARY 300 Heavy-duty Cleaner.

Here's why—

EXCLUSIVE PATENTED PUMPING SYSTEM replaces steam as source of working pressure on MALSBARY high pressure Models 250, 300 and 500. Cleaning efficiency is not limited to steam formed in the coils.

5 DISTINCT CLEANING ACTIONS. High pressure steam cleaning (to 325°F.); high pressure hot water; high pressure cold water; low pressure wet steam; and low pressure warm water. Only MALSBARY offers you all 5.

PRESSURES TO 400 LBS. This is 2 to 4 times higher than steam vapor cleaners; enables MALSBARY to do jobs other cleaners cannot touch, such as removing road tars without changing to special compounds. This high pressure permits simultaneous use of hot solution gun and cold water gun on Models 300 and 500.

All MALSBARY heavy-duty models—250, 300 and 500—develop hot solution in 2 to 3 minutes; are available with oil or gas-fired burner; gas engine or electric motor drive; stationary, portable or trailer mount.

See for yourself how MALSBARY Cleaners cut cleaning time—check coupon and mail TODAY.

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Room C2 • 845 92nd Avenue • Oakland 3, California

For small shops, MALSBARY 110 & 220 Steam Vapor Cleaners provide quick, efficient cleaning on motors, chassis, parts and maintenance jobs. Simple, rugged, gadget free.

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☐ Free booklets on MALSBARY Cleaners.
☐ "How To Make Efficient Use of Steam Cleaning" reprint.

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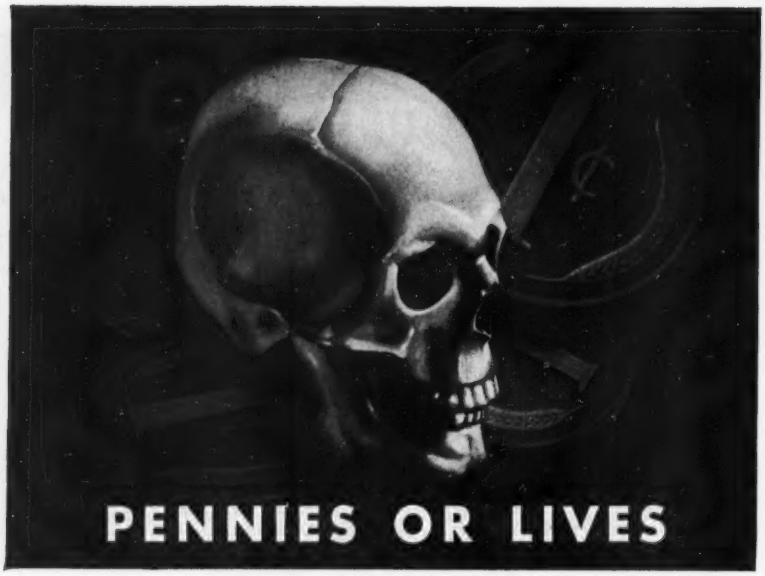


Behind many industrial accidents is the ghost of equipment failure, often caused by skimping on quality in favor of a few cents saved.

Such economies are always risky, always more costly in the end.

But when you use Laughlin Safety Hooks (and there are 15 sizes in eye, shank and swivel patterns) the extra pennies you spend will pay big dividends in protection of men and equipment.

The latch locks the load. It cannot open until released by the operator. And it's made of pressed steel or bronze with a stainless steel spring that won't rust or weaken. The cam is an integral part of the hook forging for extra strength.

The quality construction of Laughlin Safety Hooks is typical of all of Laughlin's 1500 types and sizes of drop forged wire rope and chain fittings. So remember—to save with safety always insist on the name LAUGHLIN for original equipment or replacement fittings.

Our Catalog No. 150 shows and describes the complete line. A free copy will be sent on request.

THE THOMAS LAUGHLIN CO.
214 FORE ST., PORTLAND, MAINE

LAUGHLIN
THE MOST COMPLETE LINE OF WIRE ROPE AND CHAIN FITTINGS

COUPLINGS VS. CONVERTERS—To help both the manufacturer and purchaser of equipment to better understand the application of hydraulic couplings and torque converters, a 32-p special issue of "Production Road", titled "Coupling or Converter?", has been published. The booklet uses layman's language to explain hydraulic transmission of power and to acquaint the reader with meaning and characteristics of torque and the effects of torque on both driving and driven equipment. It starts by telling the readers that a hydraulic coupling transmits only input torque, whereas a hydraulic torque converter multiplies torque—and continues on through specific advantages of each type drive, as applied to industrial machinery.—**Twin Disc Clutch Co., Racine, Wis.**

DRILL PRESSES—A 12-p catalog (No. 5206) covers the complete line of South Bend drill presses, illustrating the features with both photos and line drawings. Included are a precision model, an economy model, multi-spindle types and several attachments. — **South Bend Lathe Works, 425 E. Madison St., South Bend 22, Ind.**

INDUSTRIAL CONTROL — Complete information on temperature and humidity controls, motor-operated valves, control motors and many other products of the manufacturer, are included in a 32-p booklet just released. It covers as well, thermostats, temperature regulators, heating and air-conditioning controls, electrical accessories, etc. Requests for the booklet, labeled F-3941-2, should be sent to the advertising department of the Controls Division of **Barber-Colman Co., Rockford, Ill.**

GRADING PROFITS—is the title of an 8-p booklet by Caterpillar that contains 22 illustrations ranging from action shots to detailed cutaways of transmissions and control mechanisms. Advantages covered are: Long life of Cat engines, positive starting, 6-speed transmission, heavy circle construction, range of blade positions, visibility and blade control. Also illustrated and described are several attachments. Ask for Form 30595 from any Cat distributor or from **Caterpillar Tractor Co., Peoria, Ill.**

WHERE TO BUY

STOP *that* WATER

With FORMULA NO. 640, a clear liquid which penetrates 1" plus in concrete, brick, stucco, plaster, etc. Seals out water, dirt. Holds 20' head. Use outside and in. Preserves all absorbent materials. Sold 14 years. Quick, economical, sure. $3 in 55's. Free sample. See Sweet's.
HAYNES PRODUCTS CO., OMAHA 3, NEBR.

"she might have been my kid..."

"There was no time to stop, see? She comes running out from behind this parked car right under my wheels. Her hair is in pigtails, and with the sun shining on it, she might have been *my* kid. We got her to the hospital. It took 3 pints of blood to bring her around. All I have to do is remember the sound of those screaming tires—and I know why *I'm* giving blood."

Yes, all kinds of people give blood—truck drivers, office workers, salesmen. And—for all kinds of reasons. But whatever *your* reason, this you can be sure of: Whether your blood goes to a local hospital, a combat area or for Civil Defense needs—this priceless, painless gift will some day save an American life!

Business Executives! ✓Check These Questions!

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ☐ Have you given your employees time off to make blood donations?
- ☐ Has your company given any recognition to donors?
- ☐ Do you have a Blood Donor Honor Roll in your company?
- ☐ Have you arranged to have a Bloodmobile make regular visits?
- ☐ Has your management endorsed the local Blood Donor Program?
- ☐ Have you informed your employees of your company's plan of co-operation?
- ☐ Was this information given through Plant Bulletin or House Magazine?
- ☐ Have you conducted a Donor Pledge Campaign in your company?
- ☐ Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?

Remember, as long as a *single* pint of blood may mean the difference between life and death for *any* American . . . the need for blood is *urgent!*

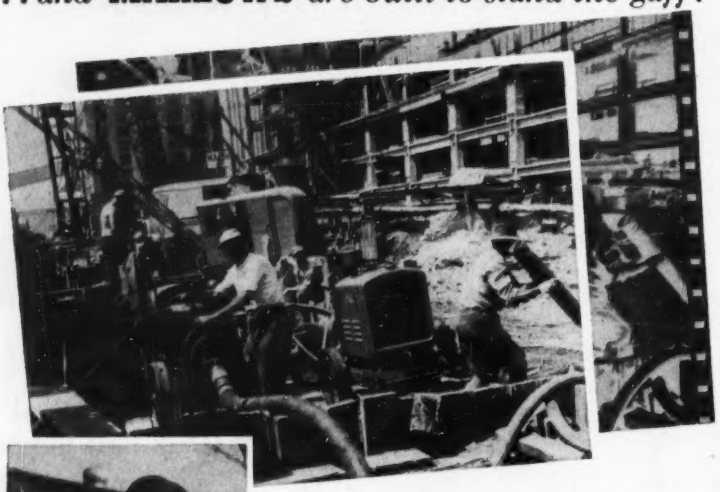
Give Blood Now

CALL YOUR RED CROSS TODAY!

NATIONAL BLOOD PROGRAM

pump rental is a "RUGGED BUSINESS"

. . . and **MARLOWS** *are built to stand the gaff!*



Here is what Harvey Reeves, of the Foundation Equipment Co., Long Island City, N. Y. has to say . . .

"We operate the largest pump rental fleets in New York and Chicago . . . and both fleets are 100% Marlows. Marlow pumps maintain new pump performance longer and can be put back into new pump condition at less cost. They are the best contractors pumps built today."

Yes . . . pump rental is the toughest kind of service. If MARLOWS are best for rental they *must* be good. Day in and day out, MARLOW Self-Priming Centrifugal Pumps are handling the toughest kind of rental jobs.

In some cases, MARLOW PUMPS — (the preferred pumps for rental fleets) — are sent as far as 500 miles from home warehouses. The pump distributor cannot take any chances of a breakdown that will seriously halt job progress — he has to have the best pump on the job. That's why so many distributors rely on MARLOWS for the rental fleet.

MARLOW Self-Priming Centrifugal Pumps are built to last longer — (cheaper to overhaul) easy to check and service in the field. Practical design assures long engine wear; after long, hard use MARLOWS can be restored to full original efficiency by simply replacing the impeller and diffuser.

Keep this in mind when you think of pumps...the largest Pump distributors rebuild all kinds of pumps but they limit the rental fleets to MARLOWS. Men who have to be right when it comes to picking the pump for the job *always rely on MARLOWS.*

• *Write today for facts, figures and specifications.*

101

MARLOW PUMPS RIDGEWOOD, NEW JERSEY

Branch Plant: De Queen, Arkansas

Other factories in France and England. Distributors and Dealers everywhere.

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BUILD PROFITABLY

and SAFELY with Safway tubular steel scaffolding—first in the field

SAFE SCAFFOLDING MEANS FAST, ECONOMICAL BUILDING. Safway scaffolding is safer in more ways than any other scaffolding you can mention. Thousands—yes, thousands—of construction firms, contractors, industrial firms are using millions of dollars worth of Safway scaffolding to speed their construction projects safely and efficiently.

For more information contact the Safway representative in your city, or write to Safway Steel Products, Inc.

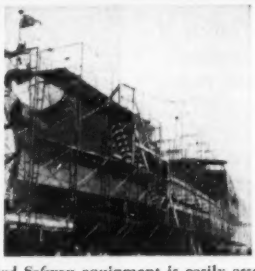
Tower of Strength

Workmen safely reach into the sky 75 feet high. They're using Safway scaffolding to dismantle a heavy steel stack in Minneapolis. Safway carbon steel frames are solidly joined with wing nuts to tubular steel cross braces for strength. All welds are made by master welders.

Corrosion Resistant

Weather and corrosion won't hurt the Safway scaffolding used in this 185 foot ski slide in Los Angeles. It's corrosion and rust resistant. Special phosphate bath converts surface of Safway steel scaffolding to non-metallic oxide. Baked-on weather resistant paint gives extra protection.

Assembled to Fit Contours



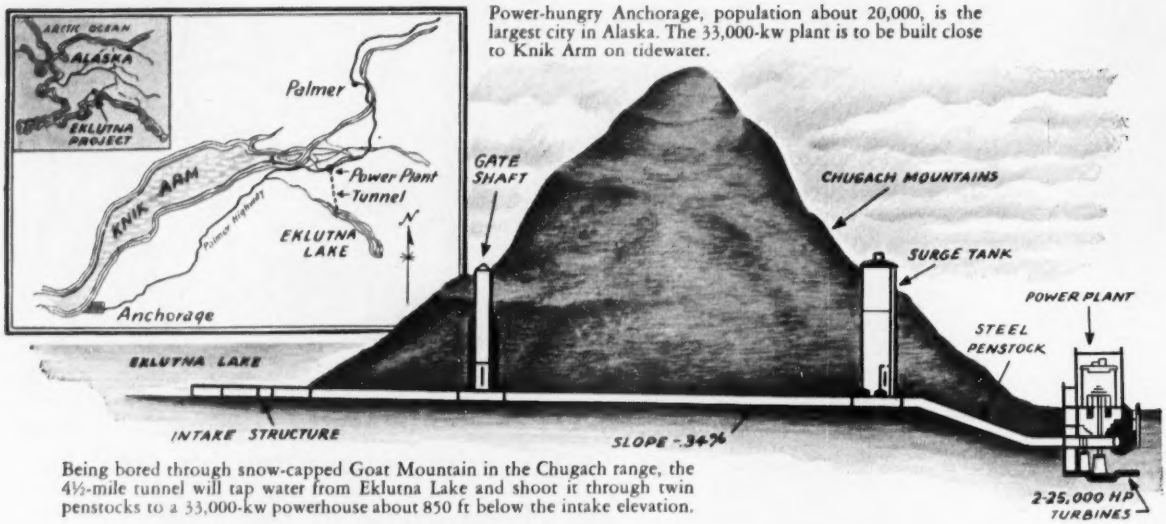
Standard Safway equipment is easily assembled to fit the curved bow and sloping sides of this vessel at the U. S. Navy yards. Only a few basic types of interchangeable members are needed to assemble scaffolds of any required shape and height.

Time-Saving and Safe

No wonder builders like balanced Safway steel scaffolding! It's engineered for structural stamina. Easy-to-assemble units speed erection of scaffolding and make dismantling simple. Pictured here is the lowest cost steel scaffold on the market for loads up to 50 lb. per sq. ft. with heights up to 40 ft.

SAFWAY STEEL PRODUCTS INCORPORATED
6243, West State St.
MILWAUKEE 13, WIS.
Manufacturers of Tubular Steel Scaffolding and Equipment

RENTED and SOLD by distributors everywhere



Power-hungry Anchorage, population about 20,000, is the largest city in Alaska. The 33,000-kw plant is to be built close to Knik Arm on tidewater.

Being bored through snow-capped Goat Mountain in the Chugach range, the 4½-mile tunnel will tap water from Eklutna Lake and shoot it through twin penstocks to a 33,000-kw powerhouse about 850 ft below the intake elevation.

Driving 4½-Mile Eklutna Tunnel for first big power project in Alaska

Late in 1951 construction got under way on Eklutna Tunnel, principal feature of a project which will harness water from a glacier-fed lake to generate electric power for the Anchorage area.

When the horseshoe-shaped tunnel has been bored 4½ miles through rock, its diameter of 11 ft will be concrete-lined to form a 9-ft conduit. Other phases of the $17,350,000 contract call for a surge tank, 1,390 ft of penstock tunnel, and alterations to a regulating dam at the outlet of the lake. The underwater intake of the tunnel will permit full operation when 60-below weather caps Eklutna Lake with thick ice.

Despite an excessive flow of subterranean water, the drilling and mucking crews have averaged a daily advance of about 20 ft from the downstream end. Rock is of a broken sedimentary type, mostly graywacke with quartz and calcite stringers. Like so many hard-rock men, the contractors are relying exclusively on Bethlehem hollow drill steel.

Due for completion in August, 1954, the contract is a joint venture of Peter Kiewit Sons, Coker Construction Co., and Morrison-Knudsen Co. The three firms are organized as Palmer Constructors for this U. S. Bureau of Reclamation project.

Main access for drilling is through an adit near the surge tank at the outlet of the horseshoe tunnel being excavated to an 11-ft diam. The jumbo mounts four drifters equipped with rods of Bethlehem hollow drill steel.

Eklutna Tunnel will be 4,500 ft below ground at its deepest point. Each round is drilled with 28 holes of 4- to 5-ft depth. Progress has been hampered by excessive water and broken rock; note steel support ribs.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM HOLLOW DRILL STEEL

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SEARCHLIGHT SECTION

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EQUIPMENT
(Used or Surplus New)
For Sale 208

CONSTRUCTION
Methods and Equipment

E. E. WEYENETH, *Advertising Sales Manager* — HOWARD T. OLSEN, *Business Manager*

Sales Representatives H. T. Buchanan, 330 W. 42nd St., *New York*; F. G. Hudson, Knox Bourne and G. A. Mack, 520 N. Michigan Ave., *Chicago*; R. E. Dorland, 68 Post Street, *San Francisco*; W. C. Bradford, 1510 Hanna Bldg., *Cleveland*; W. E. Donnell, Continental Bldg., *St. Louis*; H. L. Keeler, 1111 Wilshire Blvd., *Los Angeles*; R. C. Maultsby, 1321 Rhodes-Haverty Bldg., *Atlanta*; James Cash, First National Bank Bldg., *Dallas*. *Other Sales Offices:* Architects Bldg., 17th and Sansom Sts., *Philadelphia*. 738 Oliver Bldg., Pittsburgh; 856 Penobscot Bldg. *Detroit*; 350 Park Square Bldg., *Boston 16*; 95 Farringdon St., *London, E.C. 4.*

meet the... HEAVYWEIGHTS

JOHN L. SULLIVAN

. . . heavyweight champion of the world 1882 to 1892

weight 202
height ..... 5' 10½"
reach ..... 76"
shoe size 11½

WAYNE CRANE

. . . heavyweight champion of the ½-yd. class 1946—

working weight ..... 33,050 lbs.
lifting capacity ..... 8 tons
digging depth ..... 17' 3"
standard tread width ..... 20"

You be judge and jury—check with a Wayne Crane owner before you decide to buy any crane-excavator. Wayne Crane will pay for a phone call to the one nearest you. Your dealer will give you his name.

Prove to yourself why men who own and operate Wayne Cranes say, "It's a real heavyweight . . . built for more hours of profitable operation than any machine on the market today."

Also available—Model 20, 10-ton, self-propelled, wheel-mounted; Model 40, 12½-ton, truck-mounted.

MFD. BY WAYNE CRANE DIV., AMERICAN STEEL DREDGE CO. INC., FORT WAYNE 1, IND.

SEE YOUR WAYNE CRANE DEALER TODAY!

Complete service and parts facilities are maintained by Wayne Crane Distributors in all principal cities.

FUNK

Heavy-Duty

CLUTCHES, and POWER UNIT DRIVES

Here is the low-cost solution for keeping old equipment on the job. Repower, using FUNK Take-Offs and Clutches. Available in a wide variety of types to fit most requirements for shaft speed and installation space. Designed to fit any standard SAE flywheel housing or Ford Industrial Engine. Write for specifications, or assistance on your power problem.

FUNK Products include:

Straight Power Take-Off Clutches
Gear Reduction Take-Offs
Right Angle Take-Offs
Front End Take-Offs
Jack Shaft Extensions
Ford Tractor Conversion Kit, changes to 6 or V-8 engine, doubles power.

FUNK AIRCRAFT CO.

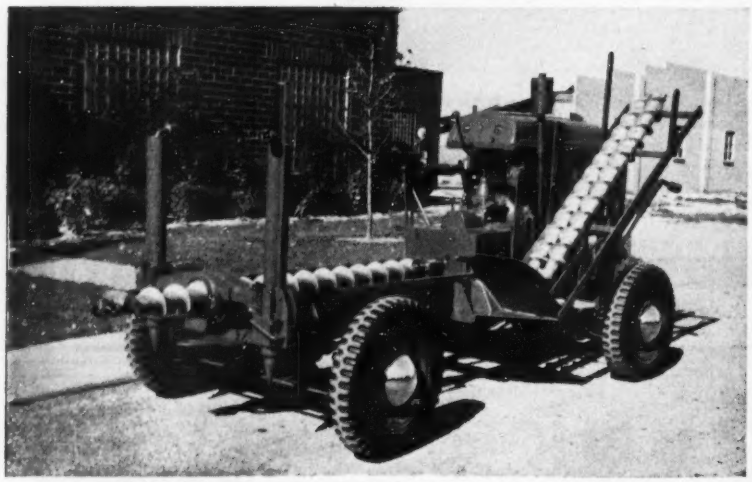
3303 Airport Drive, Coffeyville, Kansas

Parmanco LATEST IN DESIGN

HI-SPEED HORIZONTAL DRILL

Drills a 6-inch hole in two-thirds the ordinary time

Drills 5-6-8-inch holes to 100 ft. or more



NOTE: Auger rack a Parmanco feature which saves on drilling time. Augers always handy on machine as it is moved from hole to hole. Four individually adjustable leveling jacks for faster set up and smoother drilling.

• Speed, accuracy, and mobility make this newly designed drill of special value in cost and time savings. The 40 h.p. engine with four drilling speeds makes possible the reduction of footage time by one third.

Here is greater speed in retrieving augers. Also among the numerous design features are four rotating speeds and reverse for drilling and cleaning the hole.

New design includes traction drive with both forward and reverse. The drill is equipped with self-starter and generator, dual type front wheels standard equipment, and truck type rear axle with hydraulic brakes.

Automotive steering as per illustration is optional. This hi-speed horizontal drill with greater horsepower than ever before is designed to fully meet all requirements of the construction field.

PARIS MANUFACTURING CO.

PARIS, ILLINOIS

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT — BUSINESS
EQUIPMENT — USED OR RESALE
OPPORTUNITIES

UNDISPLAYED RATE

$1.50 a line, minimum 3 lines. To figure advance payment count 5 average words as a line.
Positions Wanted and Individual Selling Opportunity undisplayed advertising rate is one-half of above rate, payable in advance.

DISPLAYED RATE

The advertising rate is $13.20 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
An advertising inch is measured ⅞" vertically on one column, 3 columns—30 inches—to a page.

EQUIPMENT--used-surplus

FOR SALE

Hoist—Lidgerwood, three-drum, and swinger, 9000# SLP, rebuilt; will install electric, gas or diesel power. Rental or sale. The Finn Equipment Company, 2525 Duck Creek Road, Cincinnati, Ohio.

Roller, three wheel, Galion Warrior, Serial Number R-24233. Just rebuilt in our shops. An excellent buy at $3,350.00 F.O.B. Louisville, Kentucky, Emmett C. Watson Co., Inc., 310 E. Brandeis Sreet, Louisville, Kentucky. Phone—Calhoun 7648.

WANTED

EQUIPMENT SUPERINTENDENT

Must have complete and thorough mechanical knowledge combined with administrative ability and sober background. Caterpillar experience essential.
Work to consist of field and shop supervision of contractor's equipment located in mid-west. Mail inquiry along with self-description and complete history to

P-6712, CONSTRUCTION METHODS & EQUIPMENT
520 N. Michigan Ave., Chicago 11, Ill.

RAILS NEW and RELAYING

Your exact trackage needs filled "Faster From Foster" Track Tools & Accessories are properly matched and fabricated to meet all requirements and shipped from a reliable source.

"FASTER from FOSTER"

RENT *STEEL SHEET* **PILING**

All Lengths, Sections, all standard makes your job requires. Also Rent Pile Hammers, Pile Extractors.

TRACK ACCESSORIES • PIPE • WIRE ROPE

L. B. FOSTER CO.

Pittsburgh 30, Pa. — New York 7, N.Y.
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Superintendents and Project Managers Training Course.

All instruction by mail. Send today for sample lesson and complete details.

GEO. E. DEATHERAGE & SON
5 E. Preston St. — Baltimore 2, Maryland

"Whites have everything *for the BIG jobs"*

JOSEPH C. GARDNER
President, Gardner Cartage Co.
Cleveland, Ohio

That's the report Gardner Cartage got when they moved this 137-ton mill housing for a new strip mill installation in Cleveland. There were 12 trips just like it and this rugged and ready White Diesel did the job in record time . . . just like Whites have been performing for this well-known Cleveland company for years. "Whites have everything that is required to handle the extra-heavy jobs without costly delays," Mr. Gardner says. You can have the same efficiency and dependability with Whites. See your White Representative for facts.

40 years of Gardner Service

From this...Gardner's first carry-all...to these BIG JOBS tells the story of Gardners extra service. This model WC2864 TWD below has 185" wheelbase, 200 H.P. diesel engine, 12.00 x 24 tires, and 60,000 lb. tandem rear axle, power steering and a 50,000 lb. power winch.

THE WHITE MOTOR COMPANY • Cleveland 1, Ohio

For more than 50 years the greatest name in trucks

White

Methods Memo . . .

CONVEYOR BELT HANDLING of the iron ore and limestone used by industrial processors in Cleveland would be more economical and disrupt street traffic less than the ore boats in use today, believes the B. F. Goodrich Co.

At present, ore boats have to traverse the narrow, winding Cuyahoga River before unloading. Goodrich engineers estimate that a $6-million belt-road (exclusive of loading facilities and rights-of-way) would handle all ore and limestone 4½ mi up the valley, give the boats a quicker turnaround and eliminate most of the street traffic delays occasioned by bridges opened to pass large vessels. It is believed also that a pipeline, integral with the belt line, could be utilized for petroleum products to clear the river of tankers.

FIREPROOF CONSTRUCTIONS, 85 different types, are listed and described briefly in a summary of metal lath and plaster fire resistive ratings published by the Metal Lath Manufacturers Association. The information summarizes years of fire testing, includes fire protection information for steel columns, girders and trusses, joists, floors and partitions. For a copy, address the Association at 636 Engineers Building, Cleveland 14, Ohio.

TUNNELING RECORDS fall thick and fast on the Morrison-Knudsen of Canada, Ltd., 10-mi Alcan hydro tunnel in Western British Columbia. Latest achievement is driving 274 ft of 25-ft hole in six days, breaking the previous record of 261 ft in this same tunnel. This time, however, crews in the east heading from Horetzky Creek adit did the trick, apparently stung by all previous honors going to the gang at the west end of the tunnel at Kemano.

MANY A.G.C. CHAPTERS are conducting safety programs, but the A.G.C. of Minnesota seems to be doing an outstanding job. They hold regular monthly meetings for foremen and superintendents of all contractor members. And they get right down to simple fundamentals, too. Here are some highlights of recent meetings, as published in their Safety News: "C. T. Naugle, of Naugle-Leck, Inc., told the meeting that good housekeeping was the first law of accident prevention, and required daily inspections by supervisors. The Red Cross demonstrated the new method of artificial respiration. Al Knutson of Standard Construction Co. showed a film on safe equipment operation. Winston Bros. Company has prepared a complete, comprehensive and colorful accident prevention manual for use of its personnel in the field. Al Baumeister, chapter vice-president, is serving as construction consultant in setting up Safety Forums for the city of St. Paul." Nice going, fellows!

COPIES OF MAPS of each of the 13 counties through which the Ohio Turnpike will pass are available to contractors and others who may find them helpful in making decisions concerned with the building of the new artery and its access roads. Maps cost 10c each, are obtained by writing the Map Section, Ohio Highway Department, Central Garage, 868 W. Goodale St., Columbus, Ohio.

The 241-mi turnpike got its start in October in Summit County when the clamshell of a Lorain Moto-Crane, owned by Horvitz Construction Co. of Cleveland, took its first bite out of the excavation for a bridge abutment.

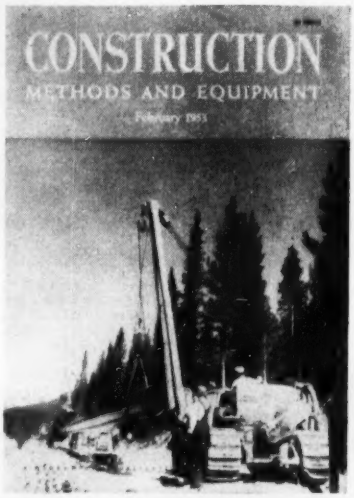
PHYSICALLY HANDICAPED persons can be employed profitably in many operations and invariably prove to be exceptionally conscientious employees. Give this some thought the next time you are staffing a job. It is an invigorating tonic to a man's soul to know that he can be useful in spite of a handicap—and the employer is equally happy with a reliable worker.

AIR STARTING MOTORS for big diesel engines are making the grade. In last month's issue (page 128) we told how Ingersoll-Rand air motors are proving out on Euclid trucks hauling iron ore in cold Minnesota. Euclid now is offering as optional equipment on its 22-ton and 34-ton rear-dumps air-driven starting motors—one for each engine in the case of twin-engine units. In addition, Euclid is installing air starters on some 20 of its monster 50-ton end-dumps, powered by two 300-hp Cummins diesels, being delivered to Western Contracting Corp., Sioux City, Iowa, for big earthmoving operations in the Missouri Valley. These were described in CM&E June 1951, p 104.

TO STIMULATE student interest in construction, the Colorado Contractors Association has established four scholarships worth $250 annually, two each at the University of Colorado and Colorado A. & M. College. Next year the number of scholarships will be increased to eight. Requirements are simple. Recipients must be residents of the state and enrolled in the civil engineering department. They are selected for their interest in heavy and highway construction, for past construction experience, for extra curricular activities, for scholarship achievement, and for need. Association contractor members agree to employ the recipients during vacations, and hope the students will continue in the construction world after graduation, but no such strings are put on them.

Awards of two $500 scholarships, one in architectural engineering, the other in civil engineering, have been made by the Master Builders of Iowa to two students at Iowa State College.

Columbia University in New York City now offers a full course leading to a B.S. degree in Construction Management.



On the Cover . . .

People pay good money for vacations in this area, but this Comstock Midwestern Ltd. crew pays little attention to the grand scenery in the British Columbia Rockies as they hoist a section of 24-in. oil pipe with a pair of Caterpillar MD8 Pipelayers for cleaning and priming. Following crew will use similar equipment for raising the pipe as it is coated and wrapped, and third gang with more Pipelayers will lower finished sections into the trench. This is part of the 711-mi line being built from interior Edmonton to tidewater Vancouver under direction of Canadian Bechtel Ltd. for Trans Mountain Oil Pipe Line Co., fully described in CM&E, October 1952, p. 62.

City of Philadelphia, Department of City Transit, Market Street Subway. Archt.—Private Plans; Contrs.—Geo. H. Flinn Corp., N. Y. C., Golder Constr. Co., Philadelphia; Sub Contr.—R. E. Carrick Co., Philadelphia; Engrs.—Howard S. Hipwell, Chief Engineer for the Department of City Transit; Lawrence Costello, Department Director. Pozzolith Central-Mixed Concrete supplied by The Warner Co., Philadelphia.

"Superior Concrete with POZZOLITH," Report Engineers of Philadelphia Subway

"Denseness for resistance to seepage, improved surface characteristics and durability" are some of the advantages obtained with Pozzolith Concrete, report the engineers of Philadelphia's new Market Street Subway.

Further evidence of the superiority of concrete produced with Pozzolith is the series of 50 cylinder tests made on this job. With a specified 3,000 lbs. concrete, Pozzolith Concrete averaged 3,210 p.s.i. for 7 days; 4,642 p.s.i. for 28 days, with many over 5,000 p.s.i.*

● ● ●

Whatever your type of job — whether industrial plant, reservoir, sewage treatment plant, dam, bridge, filtration plant, tunnel or housing project — Pozzolith Concrete provides important construction and service advantages.

Pozzolith produces these advantages — *at lower cost than by any other means* — because it disperses cement, reduces water, entrains the optimum amount of air and conforms with the water-cement ratio law.

Full information and literature on request.

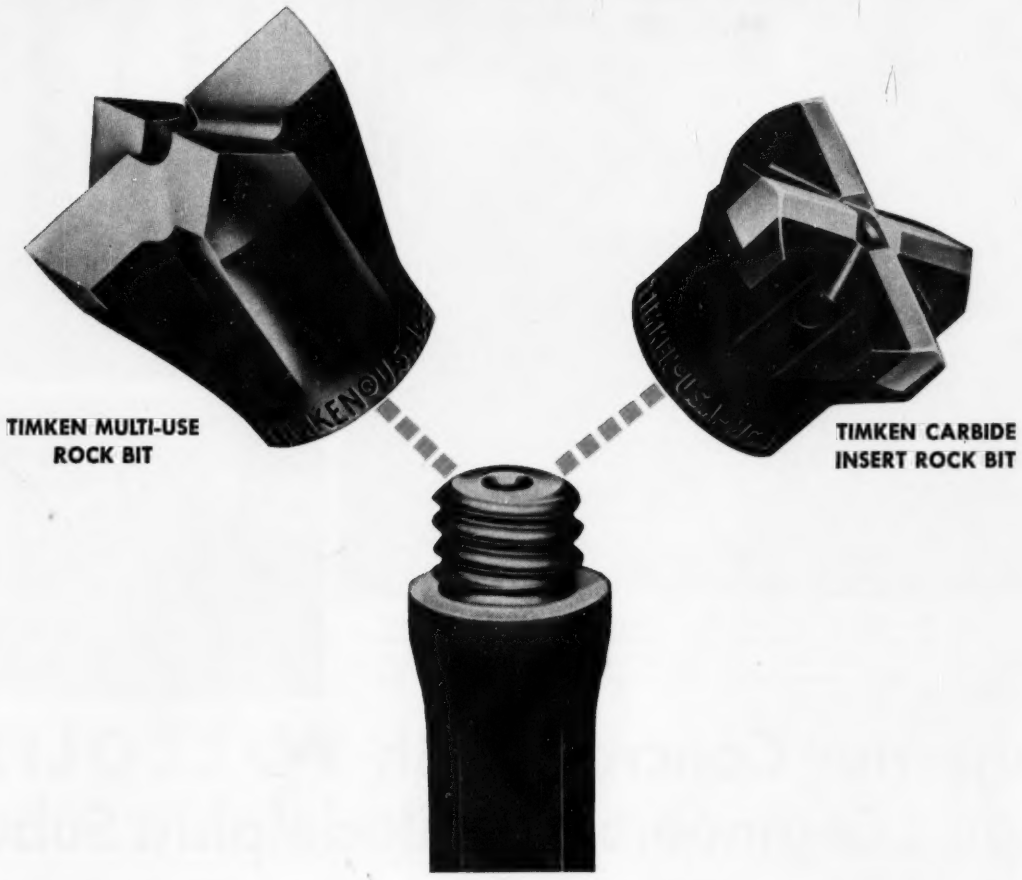
**From article in Engineering News-Record — October 11, 1951.*

Approximately 10,000,000 Cubic Yards of Pozzolith Concrete Were Placed in 1951

the MASTER BUILDERS Co.

CLEVELAND 3, OHIO — Subsidiary of American-Marietta Company — TORONTO, ONTARIO

Let one steel do the work of two with interchangeable TIMKEN® bits!



YOU don't need separate steels for each bit type when you use Timken® interchangeable rock bits. One steel does the work of two because both the Timken multi-use and carbide insert bits fit the same drill steel. With the two Timken bit types and only one steel you can switch quickly to the most economical bit as the ground changes. And you can do it right on the job.

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For greatest economy when you hit hard or abrasive ground, switch to Timken carbide insert bits. They're your best bet for maximum speed drilling, constant-gage holes, small diameter blast holes and very deep holes.

Have both types of Timken bits on hand, and you'll have the answer to every one of your drilling problems.

Timken carbide insert bits and multi-use bits are interchangeable in each thread series. And they have these three important advantages: (1) made from electric furnace Timken fine alloy steel, (2) threads are not subject to drilling impact because of the special shoulder union developed by the Timken Company, (3) quickly and easily changed.

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